Heating Piping & Air Conditioning

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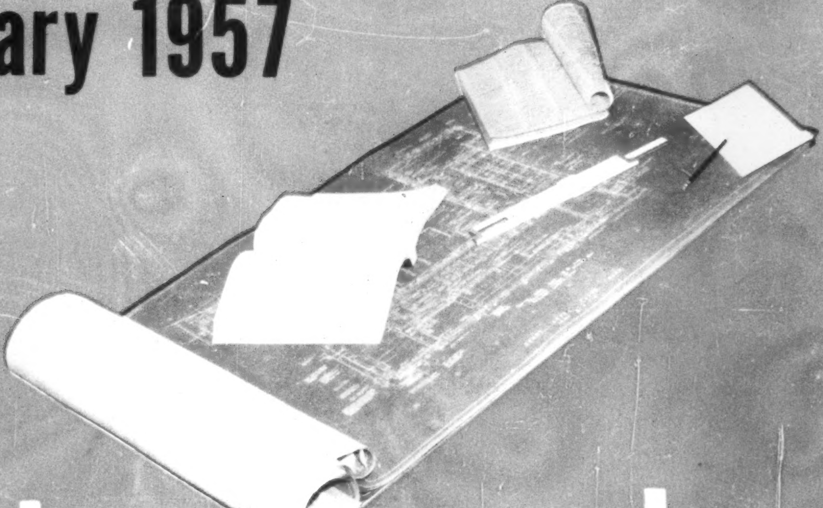
INDUSTRIAL • COMMERCIAL • INSTITUTIONAL • PUBLIC BUILDINGS

Journal Section of the American Society of Heating and Air-Conditioning Engineers—p. 189

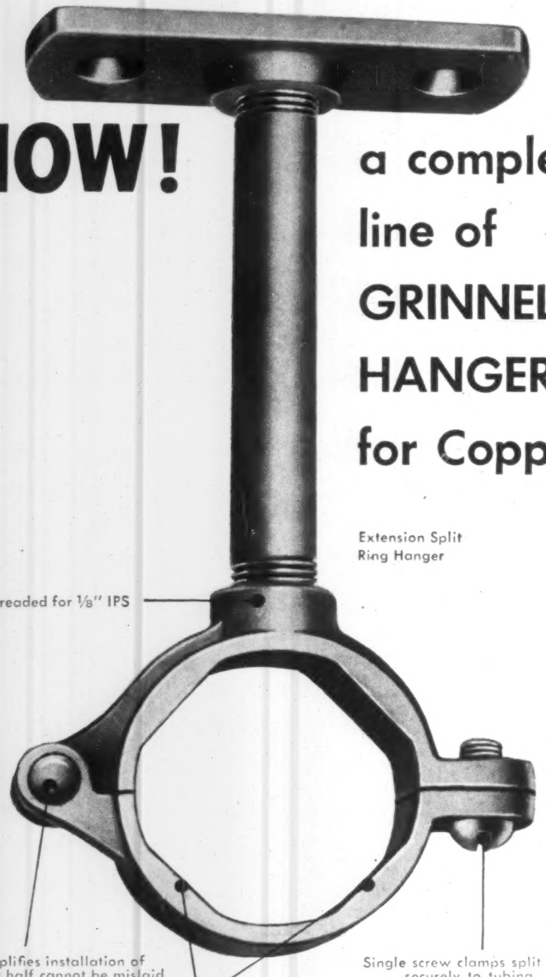
January 1957



directory number

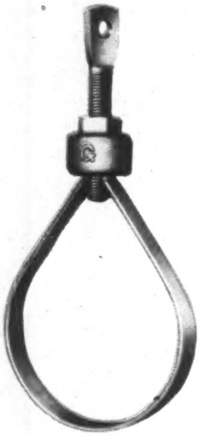
See the yellow pages for up-to-date product information

NOW! a complete line of GRINNELL HANGERS for Copper Tubing

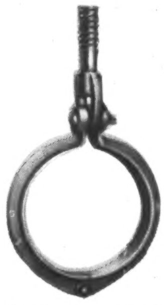

Threaded for 1/8" IPS
Hinge simplifies installation of tubing; lower half cannot be mislaid.
Four flats provide a positive clamping action
Single screw clamps split ring securely to tubing

Extension Split Ring Hanger

Adj. Wrought Clevis Hanger with Threaded Rod and C-Clamp



Adj. Wrought Ring Hanger



Split-Ring with Socket and Coach Screw

Adj. Wrought Band Hanger

Grinnell now offers, in one *complete* line, every standard type of hanger and support for copper tubing. All are heavily copper plated for long, rugged wear. All are accurately sized to fit standard copper tubing, and designed to give a neater installation wherever copper tubing is used.

For dependability, speed, and convenience . . . let Grinnell's coast-to-coast network of warehouses and jobbers serve you as a one-stop source for all your copper tubing hanger requirements. Grinnell-trained personnel are ready to work with you "on-the-job", anywhere, to help solve any problem connected with hangers and supports for copper tubing.

Whether it be for copper tubing or standard pipe, specify Grinnell hangers. No other company makes as complete a line; provides as thorough a distribution service; or can cooperate as fully on *all* your piping assignments.

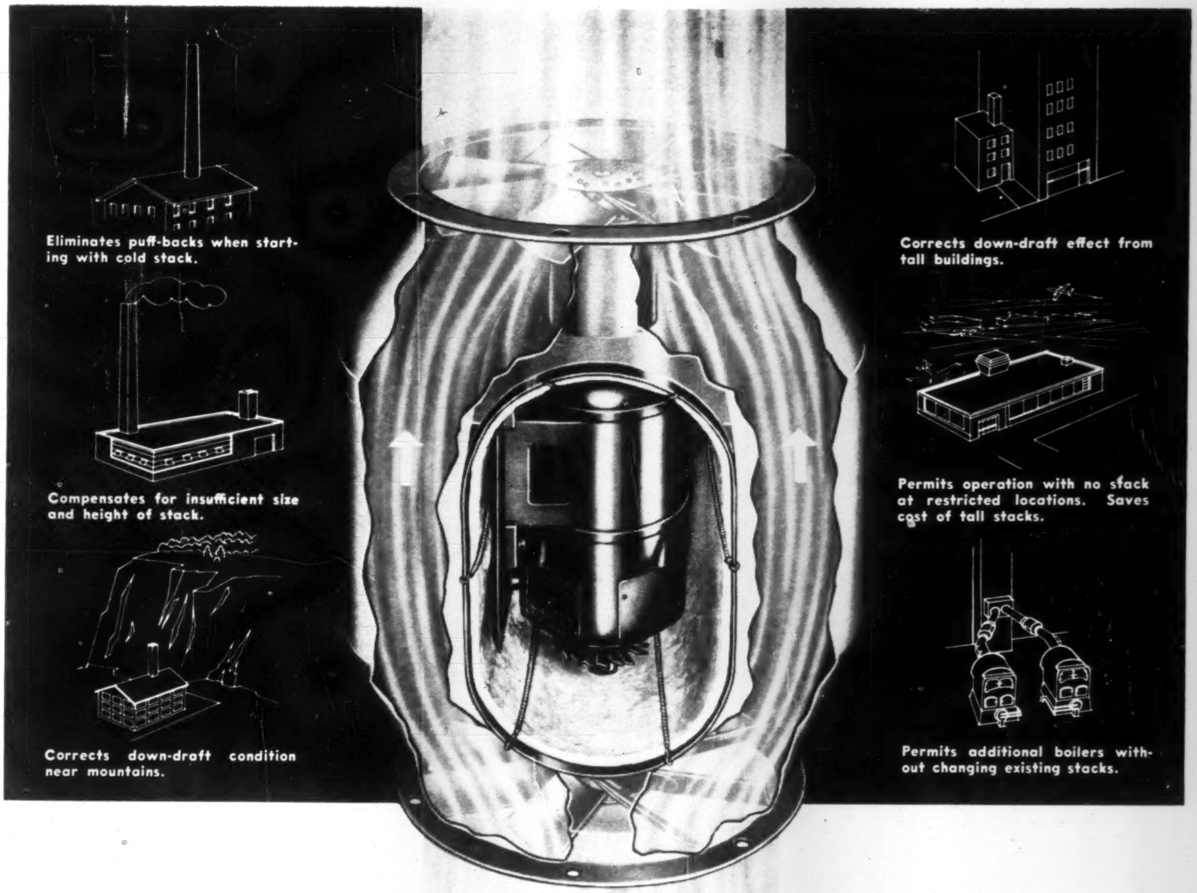
Write for your copy of
the COPPER TUBING
HANGER Catalog.
Grinnell Company, Inc.,
272 West Exchange St.,
Providence, Rhode Island

GRINNELL

AMERICA'S #1 SUPPLIER OF PIPE HANGERS AND SUPPORTS

Grinnell Company, Inc., Providence, Rhode Island • **Coast-to-Coast Network of Branch Warehouses and Distributors**

pipe and tube fittings • welding fittings • engineered pipe hangers and supports • Thermolier unit heaters • valves
Grinnell-Saunders diaphragm valves • pipe • prefabricated piping • plumbing and heating specialties • water works supplies
industrial supplies • Grinnell automatic sprinkler fire protection systems • Amco air conditioning systems



Eliminates puff-backs when starting with cold stack.

Compensates for insufficient size and height of stack.

Corrects down-draft condition near mountains.

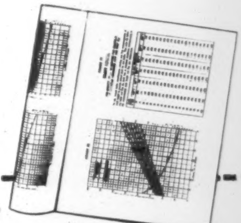
Corrects down-draft effect from tall buildings.

Permits operation with no stack at restricted locations. Saves cost of tall stacks.

Permits additional boilers without changing existing stacks.

Solve these 6 problems with INDUCED DRAFT BIFURCATORS®

Regardless of the problems posed by weather or surrounding conditions, the Induced Draft Bifurcator provides *instant* draft . . . and maintains *constant* draft at the required rate of flow of flue gas through your boiler system.



NEW BULLETIN — MAIL COUPON

DeBOTHEZAT FANS, Dept. HP-157
Division of American Machine and Metals, Inc.
East Moline, Illinois

Please send free 20-page bulletin, containing a section "How to select an Induced Draft Bifurcator."

FIRM

ADDRESS

CITY ZONE STATE

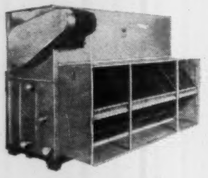
ATTENTION MR.

De Bothezat FANS
A DIVISION OF
American Machine and Metals, Inc.
EAST MOLINE, ILLINOIS

There's no *"or Equal"* when you select... Dunham-Bush

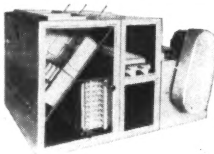
Air Conditioning Units

EXCLUSIVE INNER-FIN DESIGN • THE INDUSTRY'S MOST COMPLETE LINE



'AH' AIR HANDLING UNITS

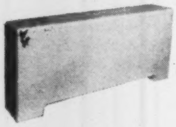
Available in 12 models from 800 CFM to 28,800 CFM. Floor-standing vertical and ceiling-hung horizontal models with direct expansion, water or steam coils. Face and by-pass damper sections, mixing boxes, spray type humidifiers and filter sections available for all units. Models AH-10 to AH-32 available with *Inner-Fin* coils.



'MZ' MULTIZONE UNITS

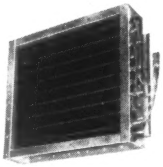
Available in 9 sizes covering a range from 2,560 CFM to 28,800 CFM, Multizone Units parallel the standard Dunham-Bush HAH Air Handling units, using the same proven blower sections and accessories such as filter sections and mixing boxes. Zone dividers may be arranged as desired—vertical, horizontal or a combination of both. Entire interior is well insulated and undercoated. Units can be shipped sectionally when this is desired to facilitate installation.

The DUNHAM-BUSH line of air conditioning equipment includes units of all types to meet your every requirement. For single-source simplicity, select quality-constructed, advanced design DUNHAM-BUSH units. And for capable engineering or specifying assistance, contact your DUNHAM-BUSH sales engineer.



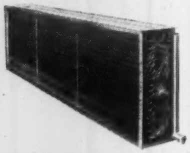
'CR' REMOTE AIR CONDITIONING UNITS

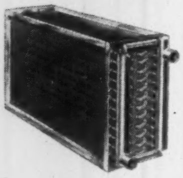
Provide quiet, economical year 'round air conditioning for all types of multi-room buildings. Units are available in vertical floor and horizontal ceiling models . . . feature individual room control . . . are easily incorporated in new or existing buildings.



'IDX' INNER-FIN AIR CONDITIONING COILS

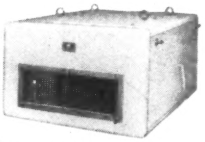
Available in standard stock sizes 2, 3, 5 and 7½ tons for simplified selection. Inner-Fin construction permits use of smaller size coil for any desired capacity. Shallower depth requires less fan horsepower. Coils completely flanged for easy installation.





DX WATER AND STEAM COILS

Dunham-Bush Water, Steam and DX Coils are supplied in standardized and matched sizes. Singly or in combination, can be arranged to fit practically any installation. Constructed of collar spaced serrated aluminum fins bonded to copper tube, staggered in direction of air flow.



'CC' COMFORT CONDITIONERS

Engineered and constructed for use in the conditioned area. Motors mounted inside casings. Attractive insulated cases, noiseless operation. Available with direct expansion coils of Inner-Fin construction. Where steam coils are desired, inner tubes of DX coil are specially circuited. Water cooling or heating coils also available.

DUNHAM-BUSH

DUNHAM-BUSH, INC.

WEST HARTFORD 10 • CONNECTICUT • U. S. A.

Heating Piping & Air Conditioning

Vol. 29 No. 1

JANUARY 1957

(with which is merged the Aerologist)

DESIGN, INSTALLATION, OPERATION AND MAINTENANCE IN INDUSTRIAL, COMMERCIAL, INSTITUTIONAL AND PUBLIC BUILDINGS

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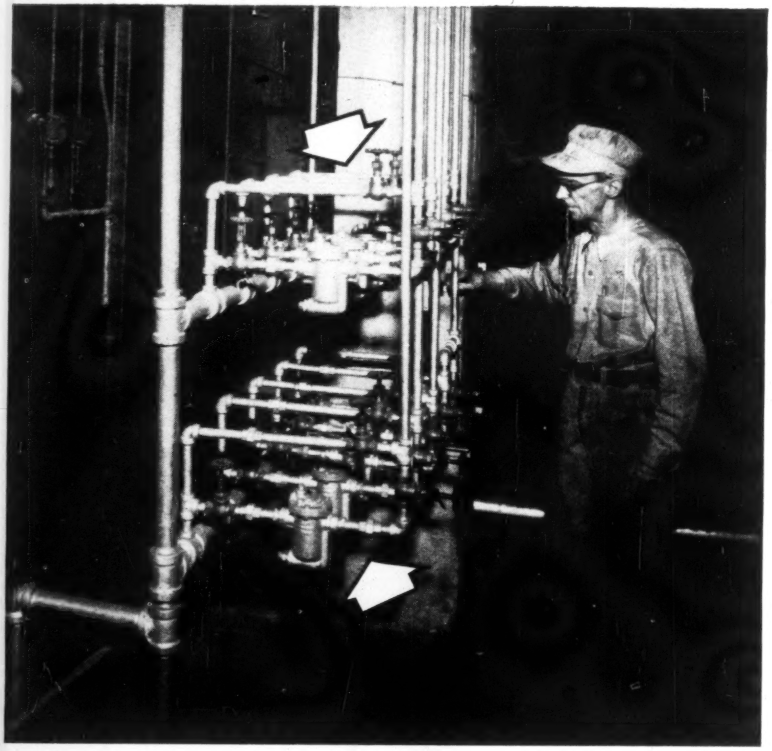
Good Trapping Practice with Good Traps Roy Davis, Maintenance Superintendent, looks over one of the well-engineered Armstrong trap installations he has made at the Masonic Temple in Detroit. Traps discharge to 15″ vacuum.

Keeping the Coffee Perkin' with Armstrong traps draining steam heated coffee urns.



Detroit's Masonic Temple Solves Vacuum Loss by Installing Armstrong Inverted Bucket Steam Traps

MANY AN engineering hour has been spent ferreting out the leaks in a vacuum return system. Here's a tip if you have the problem: *check your steam traps.* Don't worry about *flash* steam from traps—look for the traps that are leaking *live* steam. Take the case of the big Masonic Temple in Detroit:

The 11,600,000 cubic foot building has banquet space for 4500 persons at a sitting. Imagine the bedlam in the kitchen when the steam heated cooking equipment couldn't meet dinner schedules!—simply because condensate drainage was sluggish. The cooks were always in a stew and calls to the maintenance department were daily occurences.

The building buys 35 lb steam from Detroit Edison. Line pressure is used for the cooking kettles, while regulating stations supply 2 to 3 lb steam for the heating system.

Couldn't Hold Vacuum

Prior to the installation of Armstrong traps, maximum vacuum attainable was 4 inches and in some cases it was necessary to manually drain the systems and dump the condensate.

According to Roy Davis, Maintenance Superintendent, the installation throughout of Armstrong inverted bucket steam traps has solved the problem. *"I don't remember having had the chefs complain since . . . the kettles heat in a hurry now."*

F. W. Emblin, Operations Manager, adds, *"You can check the vacuum gage any time now and seldom find less than 15″ showing."*

There's another nice part to this story that only time will reveal: Armstrong traps have a habit of delivering this kind of service on low pressure vacuum return systems for years and years without repairs. Your local Armstrong Representative has plenty of cases he can tell you about. Why not call him today?

ARMSTRONG MACHINE WORKS
8741 Maple Street • Three Rivers, Michigan

FACT-FULL LITERATURE FOR YOU

THE ARMSTRONG STEAM TRAP BOOK

FREE: 44-Page Steam Trap Book plus two reprints explaining facts about trap operation on vacuum return service.

ARMSTRONG MACHINE WORKS
8741 Maple Street, Three Rivers, Michigan
Please send Steam Trap Book, "Flash at Traps" and "Vacuum Isn't Vacuum."

Name____________________

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"WHAT? FAR-AIR *filters pay for themselves in 18 months?"*

"Yes, sir. Many users report FAR-AIR filters save 75% of their original cost every year, too!"

"How come?"

"For one reason, they handle 50% more air than 'bargain brands,' so it takes 1/3 fewer filters to do the job."

"Yes, but they cost more."

"True, but you buy them only once—not over and over."

"It costs money to clean them."

"...but they hold 50% more dirt, last longer between cleanings and clean easier, so maintenance cost is 'way down."

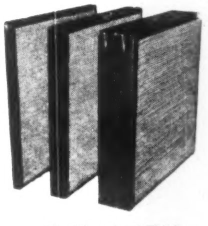
"In fact, FAR-AIR filters will save you enough over 'cheap brands' to pay for your original filter investment many times over."

"You prove that and I'll buy!"

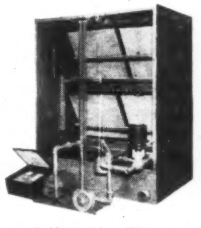
"Yes, sir, we'll start a test in your plant tomorrow."

If you would like a demonstration of FAR-AIR savings in *your* plant under *your* operating conditions, write or wire for a free evaluation test. You'll be glad you did!

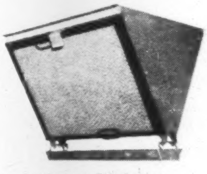
Typical **FAR-AIR** *Products*



1", 2" and 4" Thick Panel Filters



Self-Washing Filter



Grease Eliminator

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Manufacturing Licensees:
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Birmingham, England

Originators of **FAR-AIR** *Certified Filter Service*

Electronic Combustion Controls—only way to meet new U. L. requirements

Choose from the Honeywell complete line of Protectorelays* and flame sensing devices

Controls range from basic to complete sequencing, provide sure safety in the combination you need

When you choose from the Honeywell line, you have a complete choice—for the Honeywell line contains all types of controls for every possible combination.

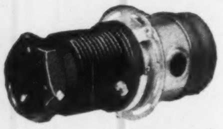
This means you can give your customers the best control system for the unit involved.

- *You have a choice of flame detection.*
- *You have a choice of burner sequencing.*
- *Manual or automatic starting.*
- *Wide range of voltages.*
- *Fast detection and response.*
- *Ease of installation.*
- *Low maintenance costs.*

These are some of the values to you and your customers when you choose from the complete Honeywell line.

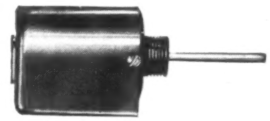
For further information, call your local Honeywell office. Or write direct to Honeywell, Dept. HA-1-15, Minneapolis 8, Minnesota.

Flame Sensing Devices



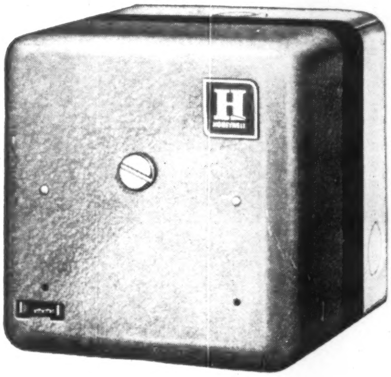
C 7003—Photocell mount for mounting on boiler front or burner face plate.

C 7004—Flame rod holder for oil or gas installations. Straight or angle body models available.

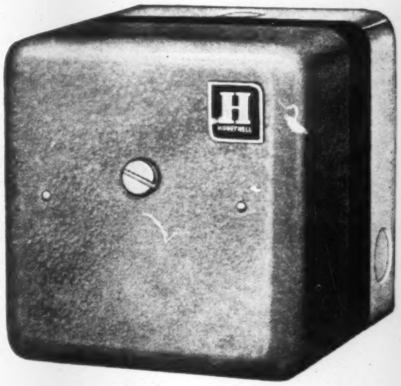


C 7007—Miniature flame rod holder for oil or gas installation.

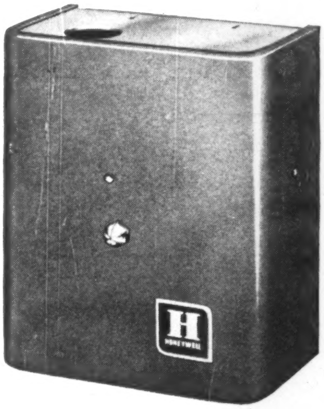
Protectorelays*



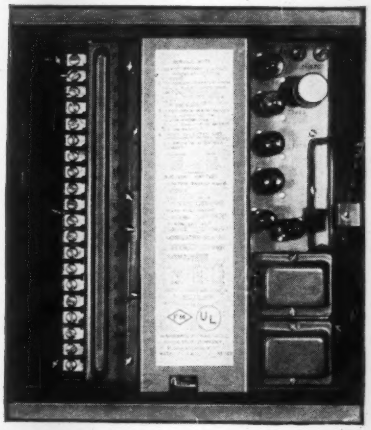
RA 890—Provides automatic self-check after any power interruption—long or short, accidental or intentional—when power is reapplied. When used alone, it returns ignition immediately to re-establish the pilot or main flame.



R 485—New Honeywell electronic flame safeguard that gives instant response to absence or presence of flame. Designed for manual-start applications, providing complete burner cut off at flame failure. Gives safeguard control of oil, gas and dual-fuel burners.

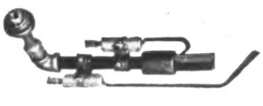


R 482D—In combination with the RA 890, it provides immediate shutoff of fuel supply and post purge after a flame failure.

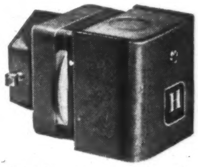


R 478—Provides pilot and main flame supervision with selectable pre-purge and ignition, fixed post-purge timing. The A-model is flame rectification type. The B model uses a lead-sulphide photocell.

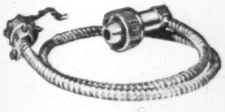
*Trademark



C 7005—Flame rectifier pilot—rod pilot and flame rod assembly for gas fired applications.



C 7010—New, externally mounted photocells for commercial oil application.



Q 283—Lead sulphide cells for use on oil, gas and combination gas-oil installations.

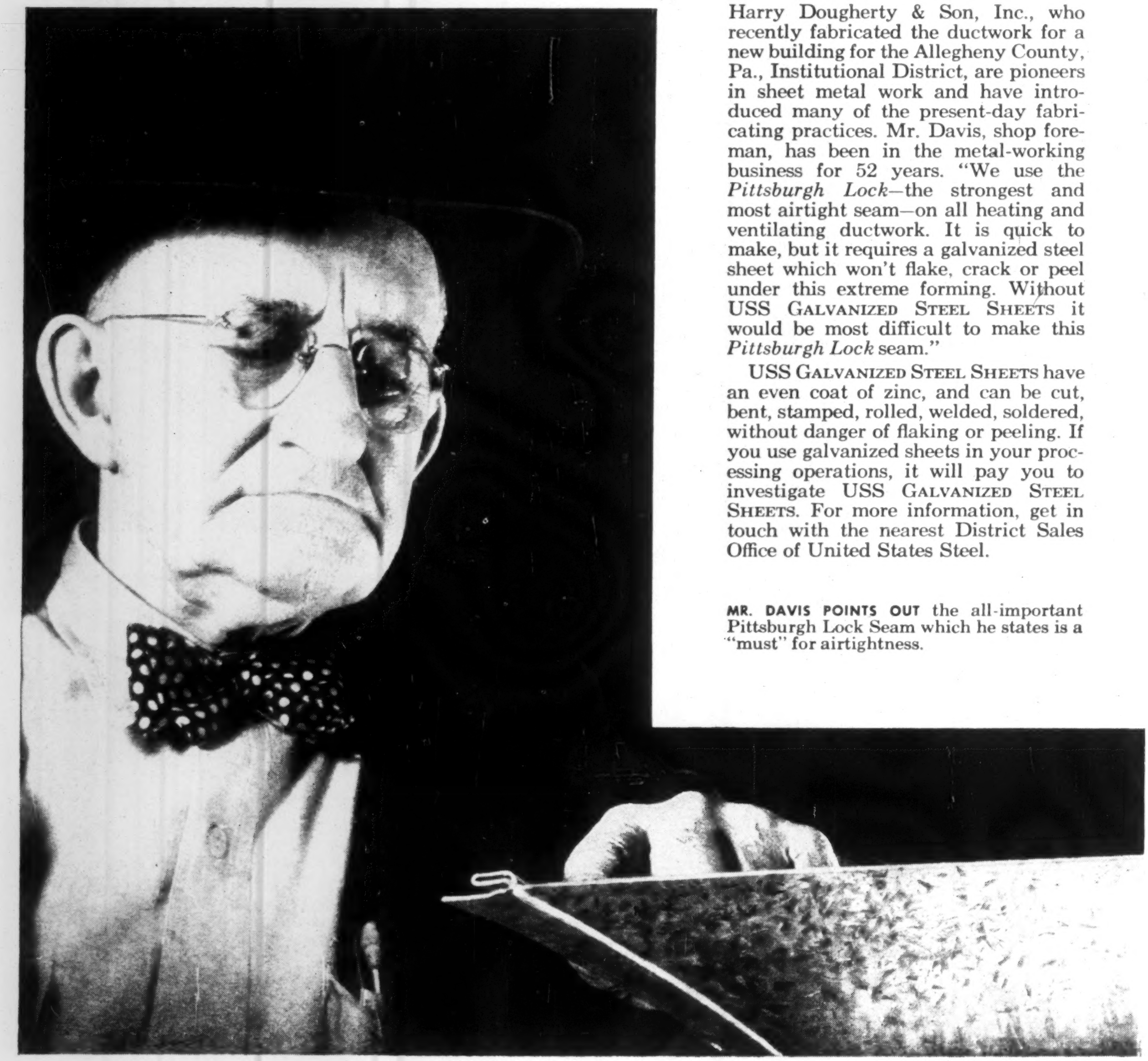
MINNEAPOLIS
Honeywell
HONEYWELL
First in Controls
112 offices across the nation

"USS GALVANIZED STEEL SHEETS do not flake, crack or peel even with extreme forming"

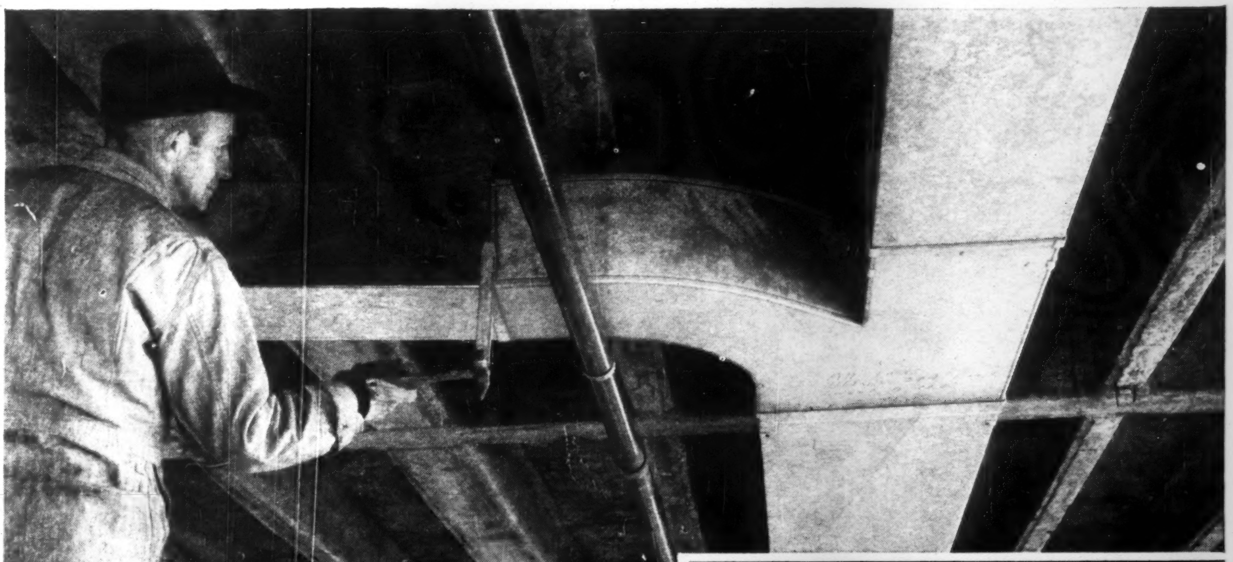
says **J. D. DAVIS,** *Shop Foreman, Harry Dougherty & Son, Inc., Freeport, Pennsylvania.*

Harry Dougherty & Son, Inc., who recently fabricated the ductwork for a new building for the Allegheny County, Pa., Institutional District, are pioneers in sheet metal work and have introduced many of the present-day fabricating practices. Mr. Davis, shop foreman, has been in the metal-working business for 52 years. "We use the *Pittsburgh Lock*—the strongest and most airtight seam—on all heating and ventilating ductwork. It is quick to make, but it requires a galvanized steel sheet which won't flake, crack or peel under this extreme forming. Without USS GALVANIZED STEEL SHEETS it would be most difficult to make this *Pittsburgh Lock* seam."

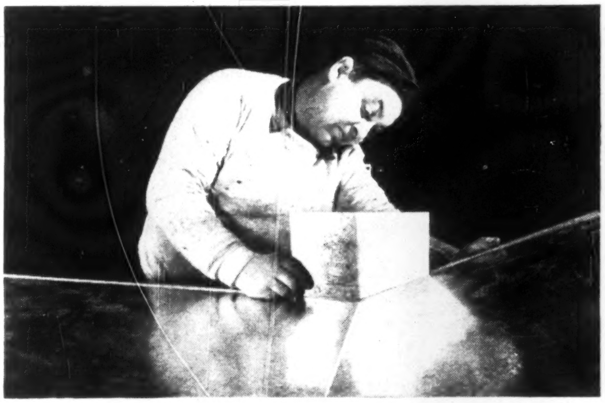
USS GALVANIZED STEEL SHEETS have an even coat of zinc, and can be cut, bent, stamped, rolled, welded, soldered, without danger of flaking or peeling. If you use galvanized sheets in your processing operations, it will pay you to investigate USS GALVANIZED STEEL SHEETS. For more information, get in touch with the nearest District Sales Office of United States Steel.



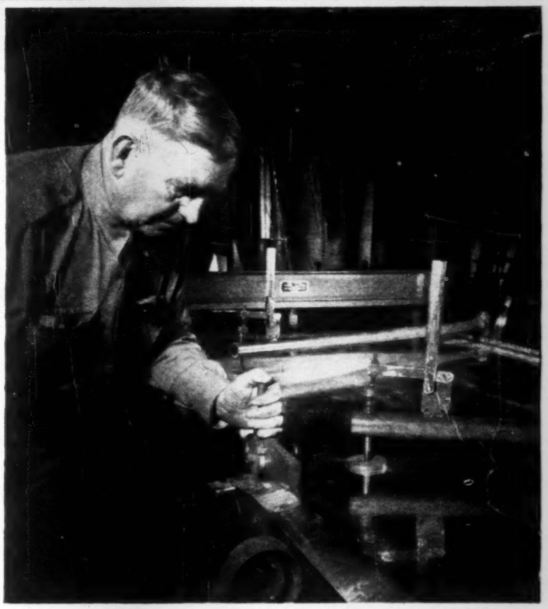
MR. DAVIS POINTS OUT the all-important Pittsburgh Lock Seam which he states is a "must" for airtightness.



ANOTHER WORKMAN SLIPS a galvanized connector onto the brackets of a duct section installed in the new institution building. Architects for this new County Institution were Mitchell & Ritchey, Pittsburgh and Button & McLean, Pittsburgh. General Contractor: Sherry-Richards, Chicago, Illinois. Mechanical Contractor: Sauer, Inc., Pittsburgh, Pennsylvania.



HERE A WORKMAN CHECKS the angle of a bend with a galvanized templet. If the zinc should chip or flake, such an accurate bend would not be possible. The die in the brake press would fill with zinc and cause a different degree angle in the die shape.



A DOUGHERTY WORKMAN, John Paton, is shown operating a notching and trimming machine—the first machine of its type ever operated in Pennsylvania. Mr. Paton is 69 years old and was recently honored by his local union for over 50 years continuous service.

USS GALVANIZED STEEL SHEETS

UNITED STATES STEEL CORPORATION, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

UNITED STATES STEEL

Production of popular pipe insulation
has been increased 150% so that —

Now EVERYONE

G-B SNAP*ON DISTRIBUTORS

ALBUQUERQUE, Mt. States Insulation Co.
AMARILLO, Ball Distributing & Engr. Co.
APPLETON, J. D. Wilson Co.
ATLANTA, Ga., Southern States Iron Roofing Co.
BILLINGS, Mont., L. W. Worthington
BIRMINGHAM, Ala., Shook & Fletcher Supply
Southern States Iron Roofing Co.
BROOKLINE, Mass., Homans-Kohler, Inc.
BUFFALO, Frontier Insulation & Supply Co.
CHARLESTON, W. Va., Baldwin Asbestos Products Co.
CHARLESTON HEIGHTS, S. C., Stafford Insulation Co.
CHARLOTTE, N. C., Guy M. Beaty & Co.
CHATTANOOGA, Guy M. Beaty & Co.
CHICAGO, E. C. Carlson Co.
CINCINNATI, R. E. Kramig & Co.
CLEVELAND, The Miles Materials Co.
COLUMBIA, S. C., Southern States Iron Roofing Co.
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DALLAS, Insulation Supply Co., Inc.
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DETROIT, Coon-DeVisser Co.
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INDIANAPOLIS, Central Supply Co.
IRON MOUNTAIN, Mich., Champion, Inc.
JACKSON, Miss., Paine Refrigeration Supply Co.
JOPLIN, Mo., Joplin Cement Co.
KANSAS CITY, Kelley Asbestos Co.
LITTLE ROCK, Gunn Distributing Co.
LOS ANGELES, Western Fibrous Glass Products
Plant Insulation Co.
LOUISVILLE, General Insulation & Roofing Co.
MADISON, Wis., J. D. Wilson Co.
MEMPHIS, John A. Denie's Sons Co.
MIAMI, Southern States Iron Roofing Co.
MILWAUKEE, J. D. Wilson Co.
MINNEAPOLIS, Asbestos Products, Inc.
MOBILE, Ala., Shook & Fletcher
NASHVILLE, Southern States Iron Roofing Co.
NEWARK, N. J., Eastern Steam Specialty Co.
NEW HAVEN, Conn., Insulation Supply Co.
NEW ORLEANS, Eagle Asbestos & Packing
NEW YORK, Eastern Steam Specialty Co.
OKLAHOMA CITY, Ball Distributing & Engineering Co.
OMAHA, Cardinal Supply & Mfg. Co.
PHILADELPHIA, John F. Scanlan, Inc.
PITTSBURGH, Dravo Corp.
PHOENIX, Ariz., Kircher Asbestos & Rubber Co.
RALEIGH, N. C., Southern States Iron Roofing Co.
RICHMOND, Va., Southern States Iron Roofing Co.
ROCKFORD, Ill., Mott Brothers Co.
SALT LAKE CITY, Bullough Asbestos Supply Co.
SAN ANTONIO, The Bracken Co.
SAN DIEGO, Western Fibrous Glass Products
SAN FRANCISCO, Western Fibrous Glass Products
SAVANNAH, Ga., Southern States Iron Roofing Co.
SCHENECTADY, N. Y., Jon Tree Sales & Supply Co.
SEATTLE, Western Fibrous Glass Products
ST. LOUIS, A. G. Brauer Supply Co.
ST. PAUL, Asbestos Products, Inc.
SYRACUSE, N. Y., Industrial Supply Co.
TAMPA, Fla., Eagle Roofing & Art Metal Works, Inc.
TALLAHASSEE, Fla., Capital Refrigeration & Supply
TULSA, Okla., Ball Distributing & Engr. Co.
TUPELO, Miss., Paine Supply Co.
WASHINGTON, Walter E. Campbell Co., Inc.
WICHITA, Jamar-Olmen Construction Co.
VANCOUVER, B. C., Fleck Brothers Limited

GUSTIN gb BACON

SNAP*ON...THE ONE AND ONLY ONE-PIECE MOLDED PIPE INSULATION OF FINE GLASS FIBERS

Sensational demand has kept Snap*On in short supply ever since its introduction several years ago — but now *everyone* can get Snap*On! To meet the ever-growing demand for this new lightweight insulation that "just snaps on the pipe", we recently made a substantial addition to its production facilities to increase Snap*On production by 150%. These new facilities are turning out the same beautifully uniform one-piece sections that have won such amazing acceptance throughout industry. Here, in a nutshell, is why Snap*On is the *standard specification* in so many industries:

Highest thermal efficiency of any pipe insulating material on the market in its temperature range.

Lower applied cost — just spread the single seam and it snaps on the pipe.

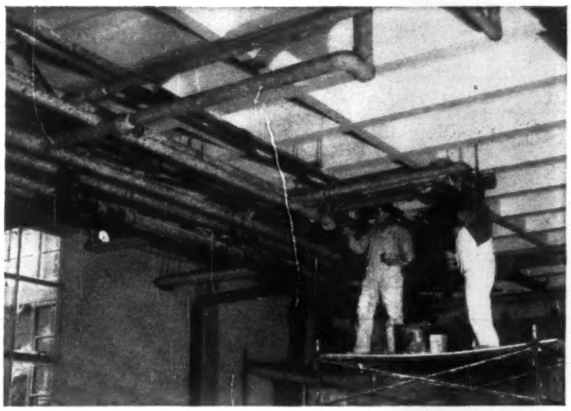
Extremely light weight . . . virtually immune to damage or breakage . . . permanent as glass itself.

So figure Snap*On in all your plans for dual-temperature, cold or heated piping where temperatures do not exceed 350° F. Whether on straight runs, on nested or tracer lines, or at flanges, valves and fittings, Snap*On's flexibility will save you time and money. It's available *now* . . . in sizes from ½" to 33" IPS from your local Snap*On distributor. His name is listed in the column at left. Call him now or—

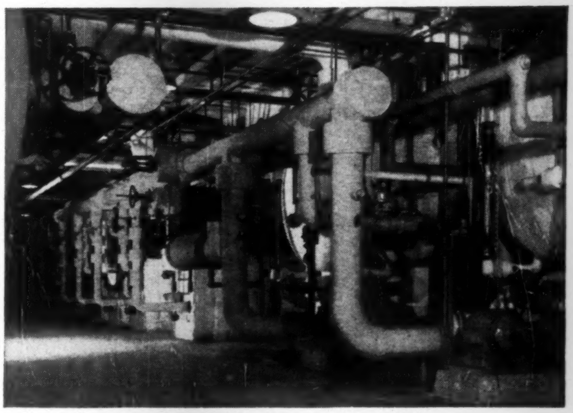
WRITE FOR NEW 8-PAGE SNAP*ON BROCHURE

*Trademark Reg.

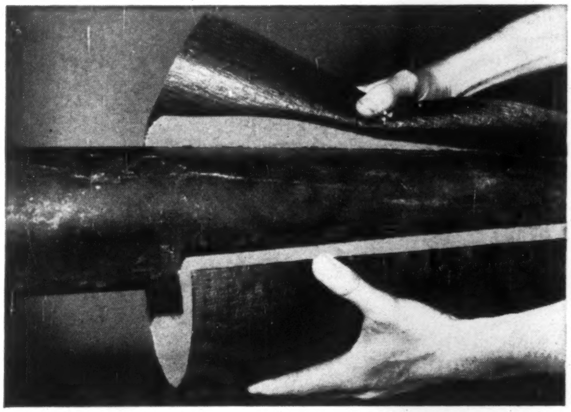
can get SNAP*ON!



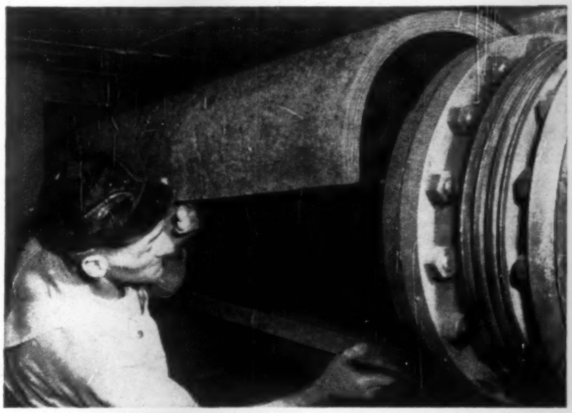
SNAP*ON . . . FOR LOW PRESSURE STEAM AND HOT WATER. For smaller lines carrying hot water or low pressure steam at temperatures up to 250°, ½" thick Snap*On is thermally superior to thicker insulations and far easier to install. Despite its light weight, its tough, resilient structure resists mechanical abuse. Snap*On *cannot* shrink and is not affected by moisture.



SNAP*ON . . . FOR SERVICES TO 350° F. In wall thicknesses from ¾" to 3" Snap*On is an ideal pipe insulation for industrial processing plants and for commercial and institutional buildings, both from the standpoint of initial cost and long-range heat savings. It is available plain, or canvas jacketed, in sizes from ½" to 33" IPS.



SNAP*ON . . . FOR DUAL-TEMPERATURE AND COLD PIPING. For such service, Snap*On is available with a wide variety of factory-applied jackets that solve every problem involving appearance, vapor resistance and fire resistance. All jacketed Snap*On comes in easy-to-handle, easy-to-apply 3' sections.



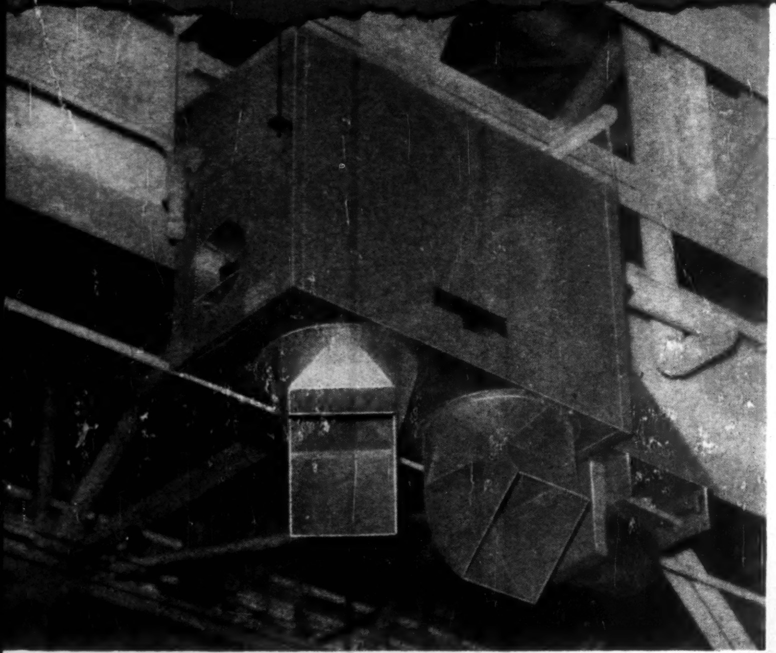
SNAP*ON . . . FOR BIG PIPING, INDOORS OR OUT. Just one easy spread-and-snap motion of the single seam—and 6 feet of 16" pipe is insulated! Fewer seams mean faster application, and far greater thermal efficiency. Plain Snap*On is available in these 6-ft. sections in sizes from 6" - 33". For outdoor use, it can also be supplied with factory-adhered weatherproofed jackets.

GUSTIN-BACON *Manufacturing Company* GUSTIN gb BACON

Thermal and acoustical glass fiber insulations • Pipe couplings and fittings • Molded glass fiber pipe insulation

220 W. 10th St., Kansas City, Mo.

"Buffalo" UNIT HEATERS —FOR EASIEST SATISFACTION

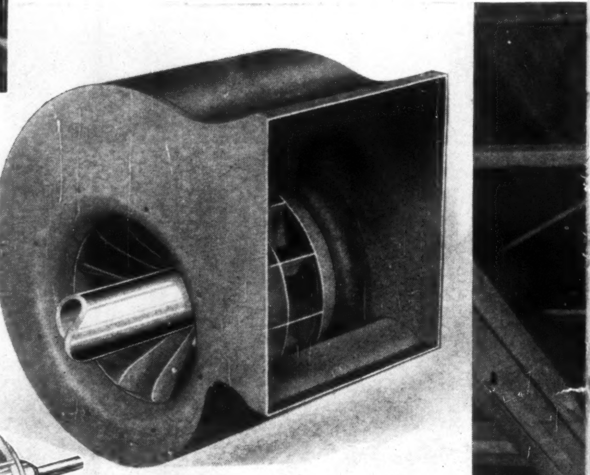


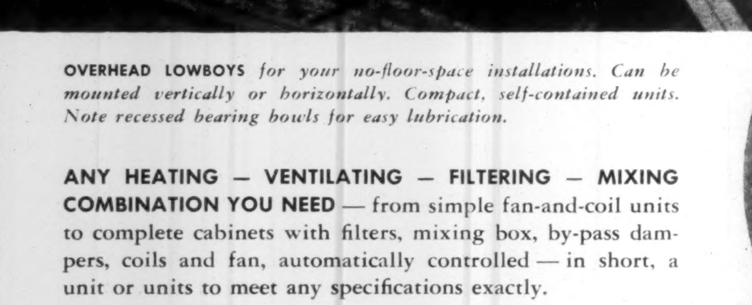
CHOICE OF MODEL FOR BEST AND EASIEST INSTALLATION — Lowboys for overhead mounting, Highboys for floor and wall installation — models for low headroom — all compact, self-contained units. Highboys and Lowboys have the exclusive "Buffalo" 90° or 45° Swivel Outlets for directing air flow accurately, or for duct connection. Adjustable V-belt drive.

EFFICIENT, DEPENDABLE "BUFFALO" FANS IN BLOWER HEAD UNIT assure quiet, stable performance under all volume and pressure conditions. Factory-balanced and vibration-free, they are the same mixed-flow type so satisfactory in "Buffalo" Air Conditioning Units. Rotor assembly mounted in sturdy demountable and interchangeable blower head section for fast, easy maintenance as well as simplified installation.

OVERHEAD LOWBOYS *for your no-floor-space installations. Can be mounted vertically or horizontally. Compact, self-contained units. Note recessed bearing bowls for easy lubrication.*

ANY HEATING — VENTILATING — FILTERING — MIXING COMBINATION YOU NEED — from simple fan-and-coil units to complete cabinets with filters, mixing box, by-pass dampers, coils and fan, automatically controlled — in short, a unit or units to meet any specifications exactly.





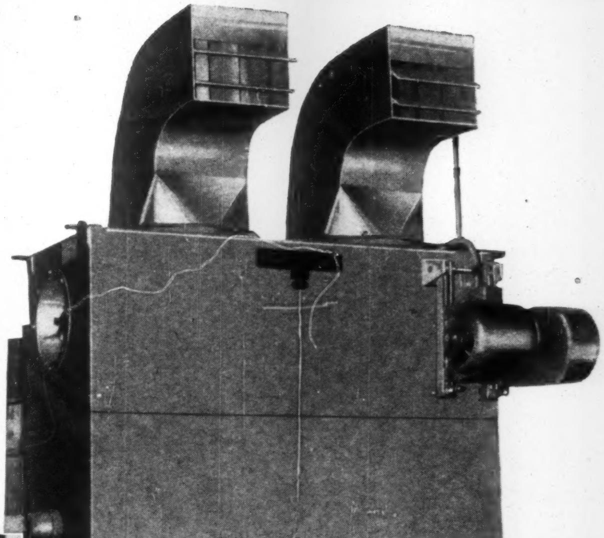
Fan rotor assembly — oversize hollow shaft for high critical vibration speed.

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT

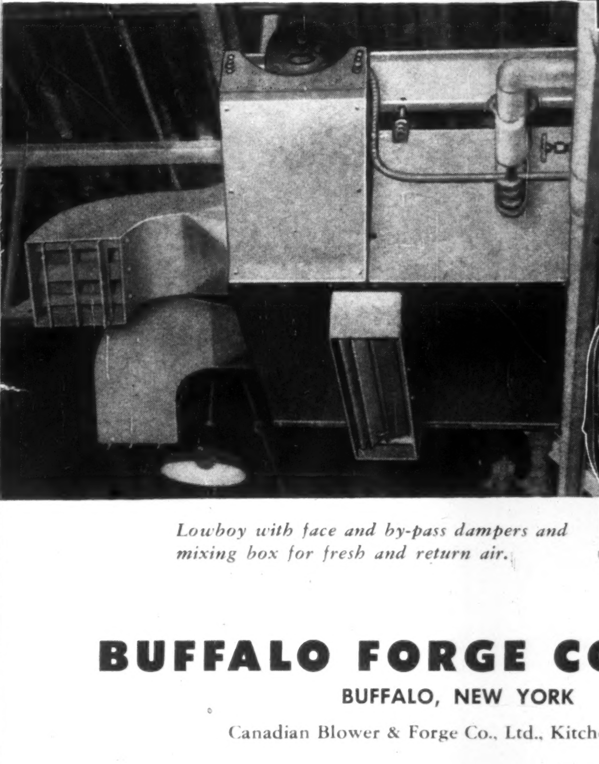
FOR EVERY APPLICATION INSTALLATION—FOR ON THE JOB

COMPLETE CHOICE OF CAPACITY — from 104,000 BTU/HR to over two million BTU/HR permits heating and ventilating very large buildings with few units, saving piping and installation expense. All units, of course, double on efficient summer ventilation. WRITE FOR BULLETIN 3704 for all details on unit arrangements, construction, temperatures and areas to be heated.

NON-FREEZE AEROFIN HEATING COILS IN SECTIONAL UNIT — compact, high-radiation-surface coils long known for their long life and freedom from troubles. Like the blower head, this is a standardized, demountable section.

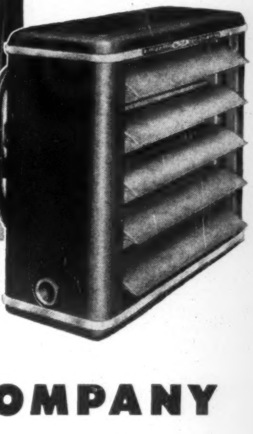


WALL-HUGGING HIGHBOYS *like this space-saving model with fresh-air filtered intake thru side wall.*



Lowboy with face and by-pass dampers and mixing box for fresh and return air.

BREEZO-FINS *in 31 sizes, 16,000 to 497,000 BTU/HR, operate on as little as 2 lbs. steam. Very easy to install almost anywhere, attractive looking, efficient, economical and quiet. Write for BULLETIN 3137.*

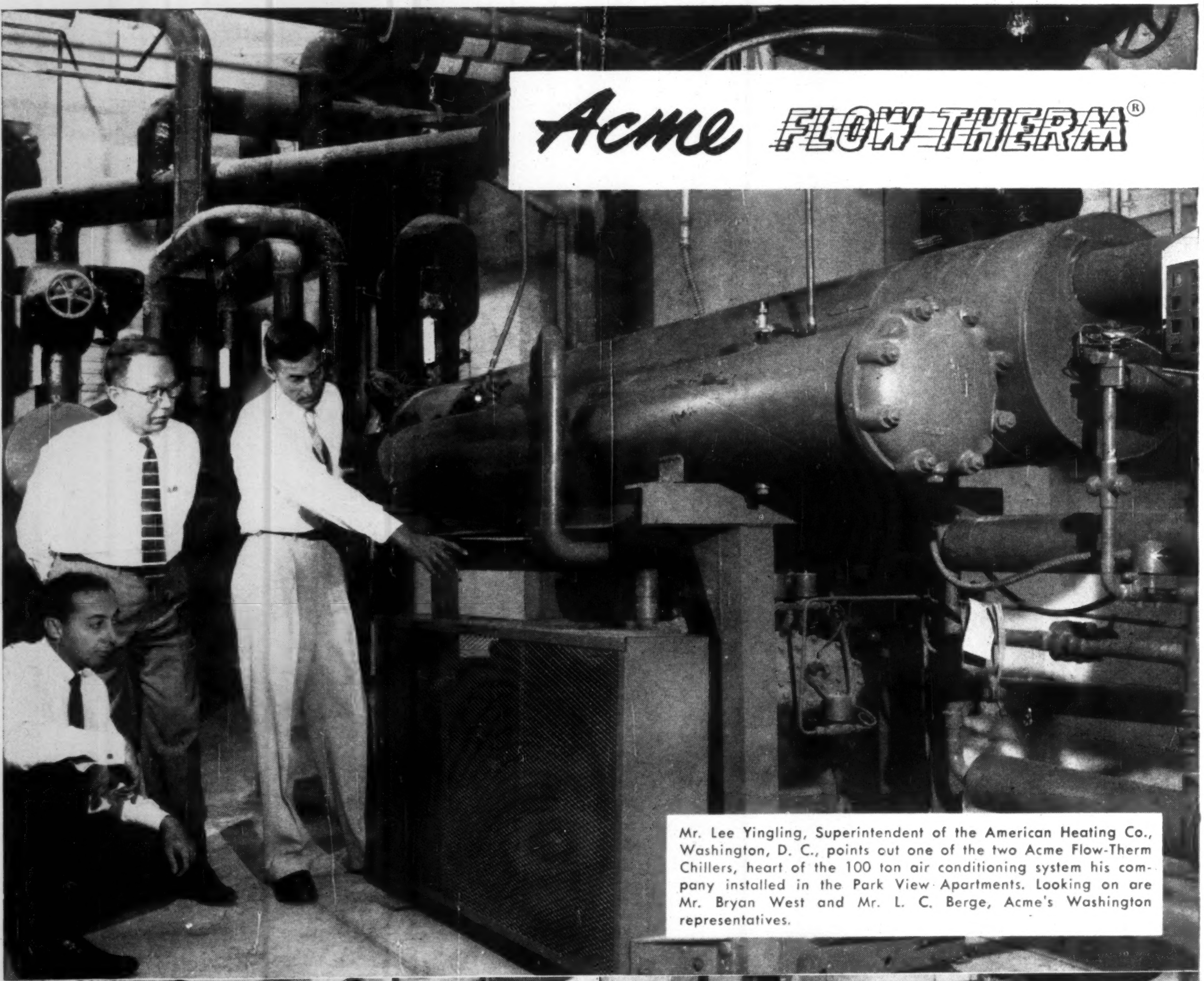


"BUFFALO" "Q" FACTOR* CONSTRUCTION in this complete line of heating and ventilating units — as in all "Buffalo" Fans, Pumps and Cabinets — is assurance of the best value for your client. Write for BULLETINS 3704 and 3137 for all details, or call in your nearby "Buffalo" Engineering Representative.

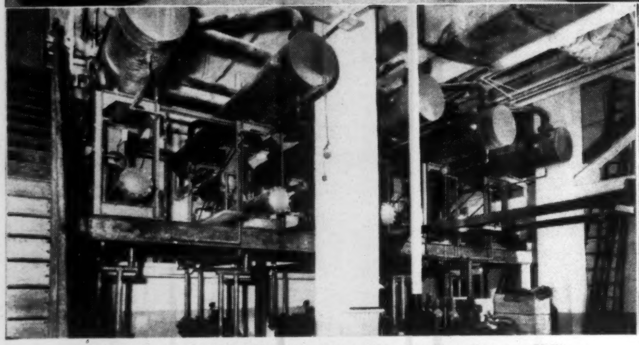
BUFFALO FORGE COMPANY
BUFFALO, NEW YORK
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo"

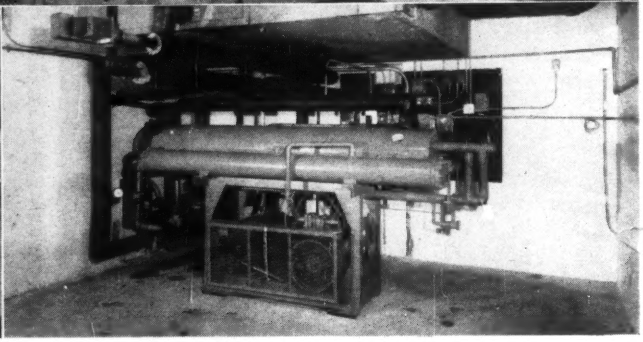
EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING



Mr. Lee Yingling, Superintendent of the American Heating Co., Washington, D. C., points out one of the two Acme Flow-Therm Chillers, heart of the 100 ton air conditioning system his company installed in the Park View Apartments. Looking on are Mr. Bryan West and Mr. L. C. Berge, Acme's Washington representatives.



MULTIPLE INSTALLATION — Five 100 HP Flow-Therm Chillers provide the Merchants Bank Building, Indianapolis, Indiana, with 500 tons of air conditioning. This system was engineered and installed under the supervision of Mr. John Beaulieu, Illingsworth Construction and Engineering Co., Indianapolis.



HEAT PUMP INSTALLATION — Merchants Bank of Miami, Florida, utilizes this 30 ton Flow-Therm Heat Pump for year-round heating and air conditioning. The system was engineered and installed by F. H. McDonald, Inc., in cooperation with Norman M. Giller and Associates, Architects.

ACME
AIR CONDITIONING
REFRIGERATION

Acme INDUSTRIES INC., Jackson, Michigan

Manufacturers of Quality Air Conditioning and Refrigeration Equipment since 1919

PACKAGED CHILLERS

PACKAGED HEAT PUMPS

EVAPORATIVE CONDENSERS and COOLING TOWERS

ROOM CONDITIONERS

the truly *FLEXIBLE* Packaged Chiller

Park View Apartments look to Acme for air conditioning comfort that sells

To insure the continuing popularity of their new Park View Apartments, Washington, D.C., Dan Pollin, Inc. insisted on having the most reliable air conditioning system possible. General Engineering Associates, consulting engineers for architects Berla and Abel, specified Acme . . . and with good reason. They wanted a system that would deliver full capacity for peak loads throughout Washington's long air conditioning season – they wanted a packaged chiller with proven dependability, one that was compact and economical to install. They knew an Acme Flow-Therm qualified in every respect.

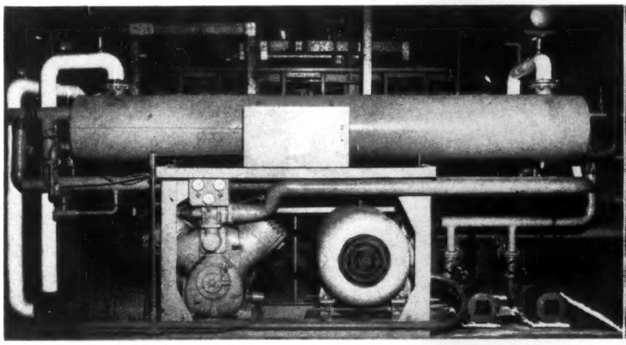
With Acme you get a more complete range of models, with capacities to fit exact job requirements. This is possible because the Flow-Therm's chief components, famous Dry-Ex Chiller and Shell-and-Tube Condenser, can be tailor-made to match compressor performance exactly – combine operating economy with maximum capacity. The Flow-Therm is the most completely engineered packaged unit in its capacity range. All controls – electrical and mechanical — are supplied complete and ready for simple installation. When you buy an Acme Flow-Therm Packaged Chiller, it arrives on the job completely assembled, ready for connection to power and liquid lines.

In addition to the normal factory tests for leaks and mechanical defects, all Acme packaged chillers are tested under full load conditions before leaving the factory. Every unit must perform satisfactorily at its nominal rating. Your guarantee of this tested operation is the new Acme Certificate of Performance, first in the industry. This assures the engineer and contractor, who specify and install Acme equipment, that Acme means *dependability*.

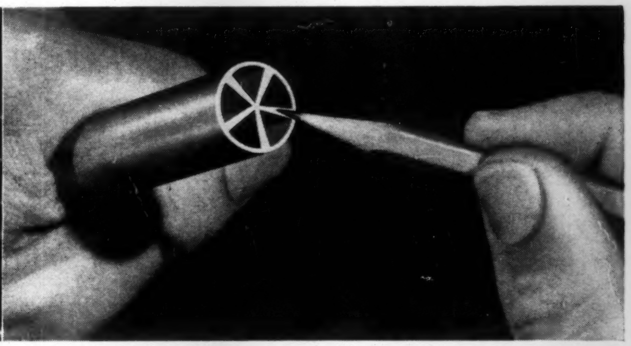
Acme Industries, Inc.

Acme Certificate of Performance issued on all Flow-Therm and Flow-Cold packaged liquid chillers, 3 through 150 tons.

PROVEN FLEXIBILITY – **Acme Flow-Therm Packaged Chillers have been proven in varied types of installations throughout the country. They have met all air conditioning, heat pump, and industrial processing requirements. Flow-Therm chillers are available in models complete with compressor, in a range from 20 through 150 tons – up to 300 tons for installations requiring remote compressors.**



PROCESS COOLING INSTALLATION — This 100-ton Flow-Therm Packaged Chiller and a Dry-Ex fluid-to-fluid Heat Exchanger is cooling Zinc Cyanide Plating solution at Ford Motor Company's Sandusky, Ohio plant. Installation was handled by Udylite Corporation under the supervision of J. K. Rawsthorne, Sales Engineer for J. Geo. Fischer & Sons, Detroit, Mich.



EXCLUSIVE FEATURE — Key component of the Acme Flow-Therm — the Dry-Ex chiller — contains STAR-INSERT TUBING, an exclusive design that more than doubles the heat transfer surfaces . . . gives more chilling capacity.

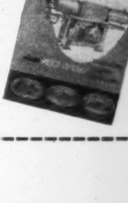
DRY-EX
LIQUID CHILLERS

LIQUID
RECEIVERS

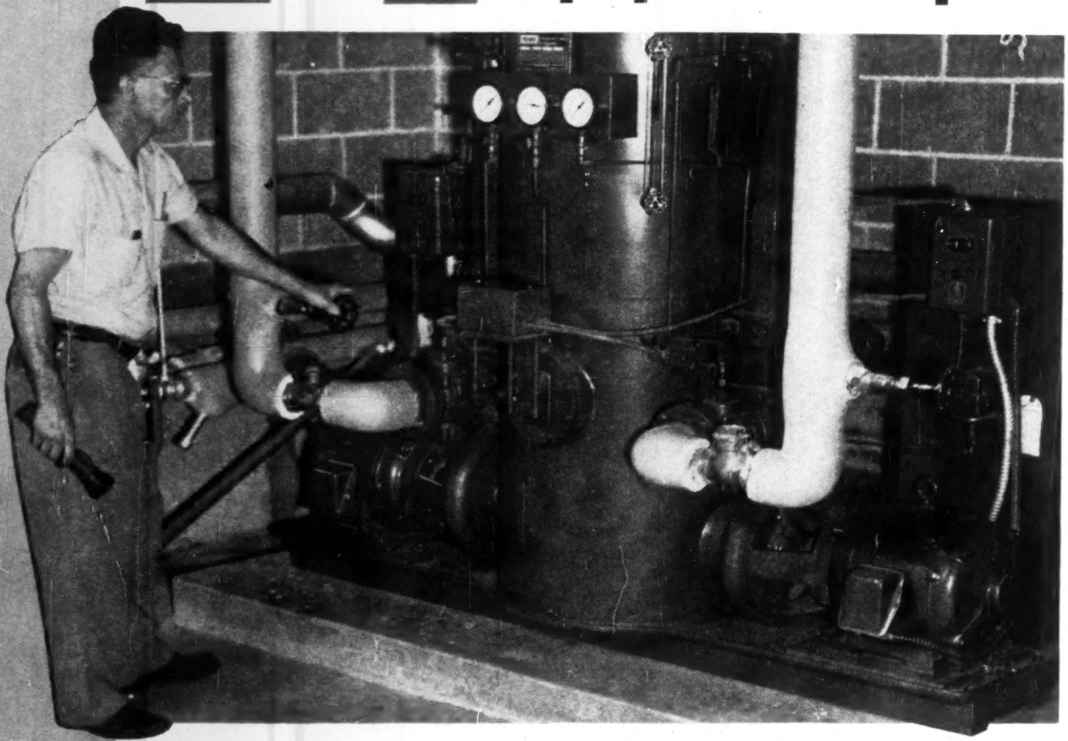
HEAT
EXCHANGERS

CONDENSERS

Clip this coupon and attach to your letterhead, to receive your new Acme Flow-Therm Catalog.



You're *sure* of *full* equipment output



65,000-ft. EDR Capacity, Duplex Type Vacuum Return Line Heating Pump . . . powered by two 5 H.P. 1750 R.P.M. Close-Coupled Century Performance-Rated Motors.

with Century Performance-Rated© MOTORS

When your equipment is driven by Century Motors, you can be sure of top performance! The reason? Century offers an unusually wide range of size, speed, frame and torque characteristics to choose from. Equipment manufacturers can provide you with *exact* application of motor to job.

For circulating pumps, compressors, cooling towers, fans, blowers, stokers . . . whatever the installation, you'll be ahead with precision performance and customer satisfaction when Century Motors are furnished. Specify Century for replacement motors, too . . . call or write your nearby Century District Sales Office or Authorized Distributor.

Performance-Rated ©
MOTORS
1/20 to 400 H.P.

CENTURY ELECTRIC COMPANY

80

1806 Pine Street • St. Louis 3, Missouri • *Offices and Stock Points in Principal Cities*

Airfoil
AIR CONDITIONING OUTLETS

by

TITUS

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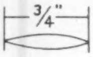
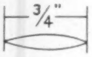
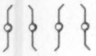
Bulletin CGL-1

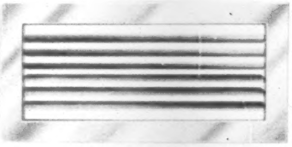
TITUS

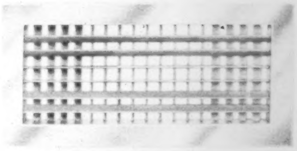
SIDEWALL SUPPLY

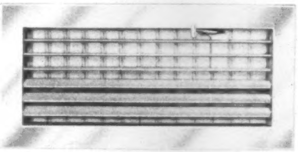
STYLE	APPLICATION	LOUVER DESIGN	LOUVER SPACING	APPEARANCE
TITUS SUPPLY GRILLES				
L-271	Sidewall. 2-way directional control. Up or down.	 Airfoil. Solid Section. Extruded aluminum.	3/4" on centers.	One set individually adjustable louvers parallel long dimension.
S-271	Sidewall. 2-way directional control. Right or left.	Same as above.	Same as above.	Same as above except louvers parallel to short dimension.
L-270	Sidewall. 4-way control. Up, down, right or left.	Same as above.	Same as above.	Two sets louvers. Front parallel long dimension. Rear parallel short dimension. Individually adjustable.
S-270	Sidewall. 4-way control. Right left, up or down.	Same as above.	Same as above.	Same as above except front parallel short dimension. Rear parallel long dimension.
TITUS SUPPLY REGISTERS				
L-274	Sidewall. 2-way directional control. Up or down plus shutoff.	 Airfoil. Solid Section. Extruded aluminum.	Front louvers . . 3/4" on centers.	Front louvers parallel long dimension. Individually adjustable.
S-274	Sidewall. 2-way directional control. Right or left plus shutoff.	Same as above.	Same as above.	Front louvers parallel short dimension. Individually adjustable.
L-275	Sidewall. 2-way directional control. Up or down plus opposed action volume control.	Same as above.	Same as above.	Front louvers parallel long dimension. Individually adjustable.
S-275	Sidewall. 2-way directional control. Right or left plus opposed action volume control.	Same as above.	Same as above.	Front louvers parallel short dimension. Individually adjustable.
L-276	Sidewall. 4-way directional control. Up, down, right or left plus shutoff.	Same as above.	Front two sets . . 3/4" on centers.	Two sets individually adjustable louvers. Front parallel long dimension. Second set parallel short dimension.
S-276	Same as above.	Same as above.	Same as above.	Same as above except front set parallel short dim. and second set — long dim.
L-277	Sidewall. 4-way directional control. Up, down, right or left. Opposed action volume control.	Same as above.	Same as above.	Two sets individually adjustable louvers. Front set parallel long dimension. Second set parallel short dimension.
S-277	Same as above.	Same as above.	Same as above.	Same as above except front set parallel short dim. and second set — long dim.
TITUS SIDEWALL & CEILING GRILLES				
L-201	Sidewall or ceiling. Heating or cooling. 1-way directional air control.	Airfoil. Curved design. Extruded aluminum.	3/4" on centers.	One set individually adjustable louvers parallel long dimension.
S-201	Sidewall or ceiling. Heating and cooling. 1-way directional air control.	Same as above.	Same as above.	One set individually adjustable louvers parallel short dimension.
L-202	Sidewall or ceiling. Heating and cooling. 2-way directional control.	Same as above.	Same as above.	One set individually adjustable louvers parallel long dimension.
S-202	Sidewall or ceiling. Heating and cooling. 2-way directional.	Same as above.	Same as above.	One set individually adjustable louvers parallel to short dimension.
No. 203	Primarily where grille must be located close to wall. 3-way directional.	Same as above.	Same as above.	Left and right side louvers parallel short dimension. Center louvers parallel long dimension. Individually adjustable.
No. 204	Ceiling — primarily in center of room. 4-way directional.	Same as above.	Same as above.	Left and right side louvers parallel short dimension. Center louvers parallel long dimension. Individually adjustable.(See cut.)
TITUS VOLUME CONTROLLERS				
AG-25	In duct behind grille or at junction of duct and branch takeoff.	Airfoil. Solid Section. Extruded aluminum louver.	1½" on centers.	1⅛" each section. 2¼" total. Hinged for greater adjustability each section. Individually adjustable.
AG-35	Attached to grille or in duct behind grille.	 20 gauge steel.	1" on cent. Pivoted on center. Opposed acting	Gang operation. Full open to full closed. Blades always parallel short dimension.
AG-45	Attached to duct behind grille or at junction duct and branch takeoff.	22 gauge steel.	1" on center.	Double duty. Can move from full open to full closed. Blades always parallel short dimension.

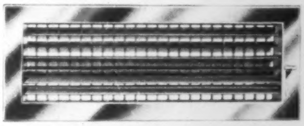
REGISTERS & GRILLES, VOLUME CONTROLLERS

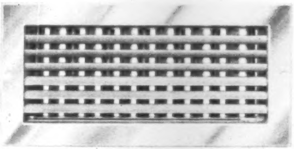
FRAME	DAMPER	DAMPER CONTROL	Approx. Free Area
1¼" ¼" Wide beveled edge. 18 or 20 ga. steel	None	None	80%
Same as above.	None	None	80%
Same as above.	None	None	80%
Same as above.	None	None	80%
1¼" ¼" Wide beveled edge. 18 or 20 gauge steel.	Multi-shutter .. spaced on 1" centers.	Standard lever operator. Remov. lever available at no extra cost. Specify R.L.L.	80%
Same as above.	Same as above.		80%
Same as above.	AG-35 opposed action.	Removable Allen wrench operator.	80%
Same as above.	Same as above.	Same as above.	80%
Same as above.	Multi-shutter .. spaced on 1" centers.	Standard lever operator. Remov. lever available at no extra cost Specify R.L.L.	80%
Same as above.	Same as above.		80%
Same as above.	AG-35 opposed action.	Removable Allen wrench aperator.	80%
Same as above.	Same as above.	Same as above	80%
1¼" ¼" Wide beveled edge. 18 or 20 gauge steel.	Optional	(See Note A)	80%
Same as above.	Optional	(See Note A)	80%
Same as above.	Optional	(See Note A)	80%
Same as above.	Optional	(See Note A)	80%
Same as above.	Optional	(See Note A)	80%
Same as above.	Optional	(See Note A)	80%
Channel type. 20 gauge cold rolled steel.		None	
Same as above.		Removable Allen wrench operator.	
None		Several types remote operators. Write Main Off.	

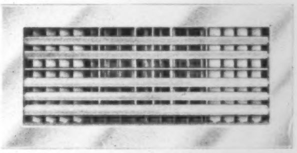

- L-271 — Supply Grille

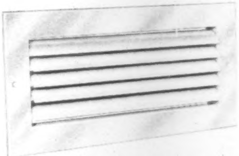

- L-270 — Supply Grille

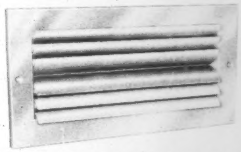

- L-274 — Supply Register

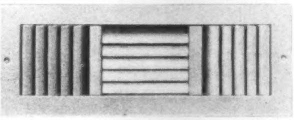

- L-276 — Supply Register

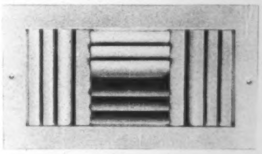

- L-275 — Supply Register

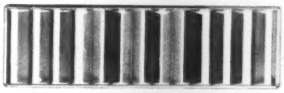

- L-277 — Supply Register

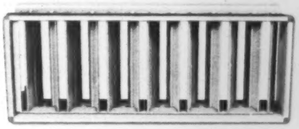

- L-201 — S'wall & Ceiling Grille

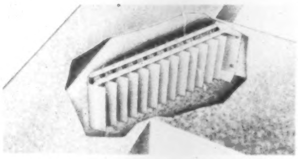

- L-202 — S'wall & Ceiling Grille


- 203 — Sidewall & Ceiling Grille


- 204 — Sidewall & Ceiling Grille


- AG-25 — Volume Controller


- AG-35 — Volume Controller


- AG-45 — Volume Controller

NOTE (A)

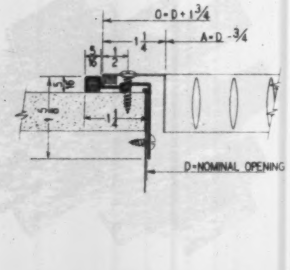
TITUS SIDEWALL & CEILING GRILLES

1. Available with opposed blade damper. Specify 2015, 2025, 2035, 2045.
2. Available with multi-shutter damper. Specify 2014, 2024, 2034, 2044.
3. Available with rear ser individually adjustable aluminum louvers. Specify 2013, 2023, 2033, 2043.

TITUS SIDEWALL RETURN

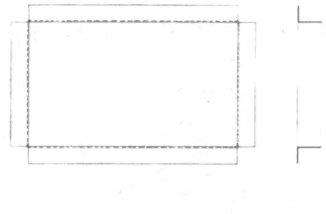
STYLE	APPLICATION	LOUVER DESIGN	LOUVER SPACING	APPEARANCE
TITUS RETURN AIR GRILLES				
RL-230	Sidewall. To match all Titus Airfoil supplies.	Heavy steel. Curved and hemmed for added strength.	¾" on center.	Blades fixed at 45° or 0° deflection. Parallel long dimension.
RS-230	Same as above.	Same as above.	Same as above.	Same as above except parallel to short dimension.
TITUS RETURN AIR REGISTERS				
RL-240	Sidewall. Return air plus multi-shutter damper.	Heavy steel. Curved and hemmed for added strength.	¾" spacing in front.	Front blades fixed at 45° or 0°. Parallel long dimension.
RS-240	Same as above.	Same as above.	Same as above.	Same as above except parallel to short dimension.
RL-241	Sidewall. Return air plus opposed action damper.	Same as above.	Same as above.	Front blades at 45° or 0° deflection. Parallel long dimension.
RS-241	Same as above.	Same as above.	Same as above.	Same as above except parallel to short dimension.
TITUS DOOR GRILLES				
T-700A	Exhaust and return air grilles for doors, walls or partitions.	V-Shaped to prevent "see thru."	½" on centers.	Closely spaced V-shaped louvers parallel to long dimension.
T-700B	Same as above.	Same as above.	Same as above.	Same as above.
T-800	Exhaust and return air grille for Panel Type doors.	V-Shaped to prevent "see thru."	3/16" on centers.	Closely spaced V-shaped louvers parallel to long dimension.
T-800A	Same as above.	Same as above.	Same as above.	Same as above except has frame.
T-800B	Same as above.	Same as above.	Same as above.	Same as above except has flange frame.
TITUS GYMNASIUM GRILLES				
G-1	Sidewall in school gymnasiums.	14 gauge round edged steel blades.	⅜" on centers.	Grille face only. Vertical steel support bars on 6 inch centers.
G-2	Same as above except has volume controller.	Same as above.	Same as above.	Grille face combined with volume controller.
TITUS CONVECTOR GRILLES				
C-2100	Low sidewall.	20 gauge steel — hemmed edges.	½" on centers.	Available 1" blades deflected 45° on 12" centers or zero degrees on 6" centers.
C-2200	Same as above except has multi-shutter damper blades for positive shut-off.	Same as above.	Same as above.	Same as above except provided with 1⅜" multi-shutter damper blades.
C-2300	Low sidewall.	20 gauge steel — outside edges hemmed.	¾" on centers.	Available with 1" blades deflected 45° on 12" centers, or zero degrees on 6" centers. Specify.
C-2400	Same as above except has multi-shutter damper blades for complete shutoff.	Same as above.	Same as above.	Same as above except provided with 1⅜" multi-shutter damper blades.

TITUS ALL-PURPOSE FRAMES



NO. 115 FRAME

For all Airfoil grilles and registers. Can be installed before or after plastering has been completed. Frame may be imbedded in plaster. Sponge rubber gasket to prevent air leakage. Designed for use with Titus Airfoil registers and grilles only.

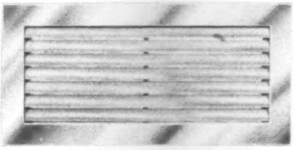


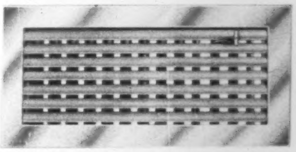
NO. 2 STEEL ANGLE FRAME

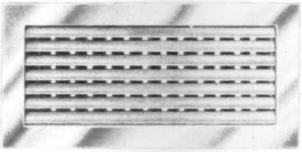
Attaches inside duct outlet with metal screws. Strengthens duct edge for easier and better plastering. Grilles fit inside frame. Grille border conceals lip of frame inside.

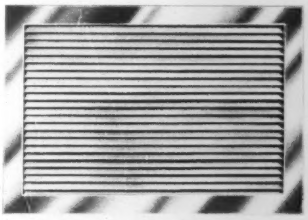
AIR REGISTERS, GRILLES and ACCESSORIES

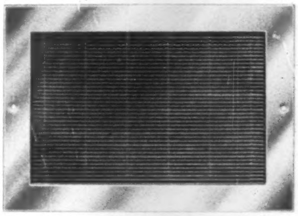
FRAME	DAMPER	DAMPER CONTROL	Approx. Free Area
1¼" ¼" Wide beveled edge. 18 or 20 gauge steel.	None	None	82%
Same as above.	None	None	82%
1¼" ¼" Wide beveled edge. 18 or 20 gauge steel.	Multi-shutter on 1" cent. Parallel short dimen.	Standard lever operator. Remov. lever available at no extra cost. Specify R.L.L.	82%
Same as above	Same as above. Except parallel long dimension.		82%
Same as above	AG-35 opposed action.	Removable Allen wrench operator.	82%
Same as above	Same as above.	Same as above.	82%
Channel type. 20 ga. cold rolled steel.	None	None	56%
Flange type, 1-5/16" beveled edge.	None	None	56%
Core only. No frame.	None	None	66%
Channel type. 20 ga. cold rolled steel.	None	None	66%
1¼" beveled edge.	None	None	66%
1¼" ¼" Extra wide 16 ga. steel border.	See G-2	See G-2	80%
Same as above.	Individually adjustable blades.	None	80%
1¼" ¼" 16 gauge cold rolled steel.	None	None	70%
Same as above.	Multi-shutter .. spaced on 1" centers.	Lever knob operator on face of grille.	70%
Same as above.	None	None	70%
Same as above.	Multi-shutter .. spaced on 1" centers.	Lever knob operator on face of grille.	70%

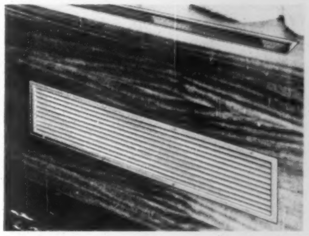

• RL-230 — Return Air Grille

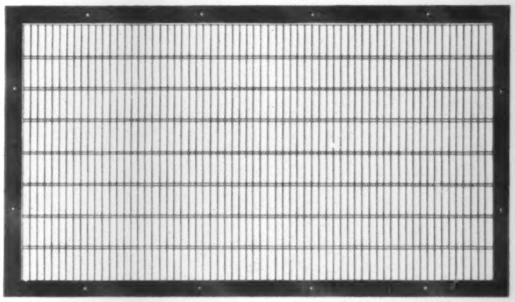

• RL-240 — Return Air Register

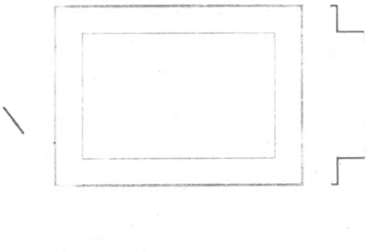

• RL-241 — Return Air Register


• T-700 — Door Grille


• T-800 — Door Grille


• Convector Grille


• Gymnasium Grille



NO. 3 FRAME

For installation before or after plastering. No. 3 frame is built to actual listed size. Duct openings should be ⅛" larger to accommodate frame.

NOTE THESE ADDITIONAL SPECIFICATIONS:

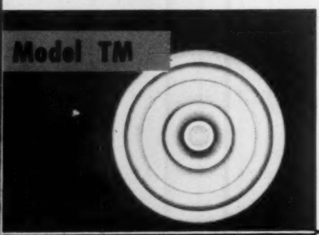
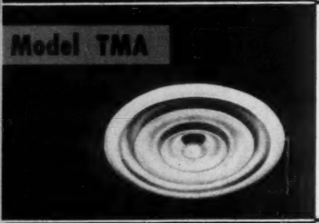
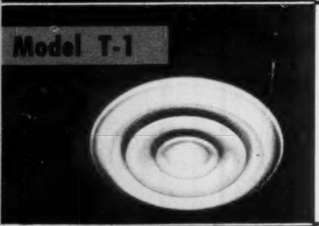
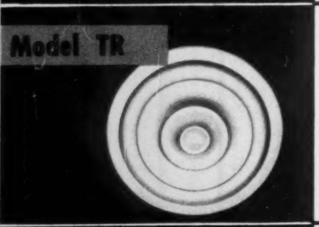
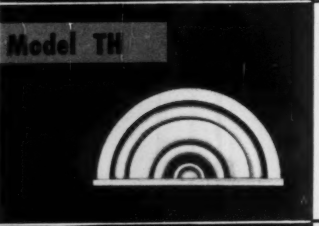
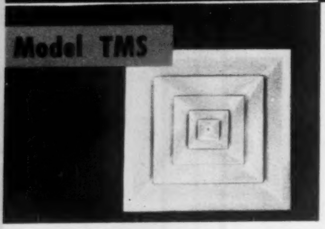
A. These added features are standard on each SUPPLY GRILLE.
   1. ¼" sponge rubber gasket.
   2. Countersunk screwholes.
   3. Attractive softone gray lacquer finish.
   4. Special mullion support where louvers exceed 20" in length.

B. VOLUME CONTROLLERS have standard black lacquer finish. Gaskets furnished on all AG-25 and AG-35s. Models are designed to fit into duct by friction.

C. RETURN AIR GRILLES are made extra heavy to withstand low sidewall abuse. Finished with standard gray softone lacquer.

D. RETURN REGISTERS are made with extra heavy steel to withstand low sidewall use and abuse. Provide volume control or complete shutoff. Have gray softone prime finish.

TITUS CEILING

STYLE	SIZES	APPLICATION	DESCRIPTION
Model TM 	6" 16" 8" 18" 10" 20" 12" 24" 14" 30" 36"	For exposed ductwork or flush mounting	A fixed cone ceiling outlet with exclusive Titus curved contour cone construction. 4 cones. Ingenious spring lock arrangement permits quick, easy removal or installation of inner cone assembly. Inner cone assembly adjustable at factory or on job to 3 different air patterns — vertical, horizontal, or intermediate.
Model TMA 	6" 16" 8" 18" 10" 20" 12" 24" 14" 30" 36"	For exposed ductwork or flush mounting	A fully adjustable outlet with Titus curved contour cone construction. Simply turn small center cone to adjust to any air pattern desired for any heating or cooling application. 3 center cones move in unison, retaining same relative position for maximum uniformity of design, minimum pressure loss. Inner cone assembly quickly, easily removed.
Model T-1 	6" 14" 8" 16" 10" 18" 12" 20" 24"	For exposed ductwork or flush mounting	A 3-cone supply outlet that combines economy with excellent diffusion performance. Inner cone assembly removes for fast, easy installation. Adjustable — on the job — to 2 air patterns by simply changing screws on inner cone assembly. Heavy-duty sponge gasket around outer edge of diffuser assures air-tight installations.
Model TR 	8" 18" 10" 20" 12" 24" 14" 30" 16" 36"	For exposed ductwork or flush mounting	A combination air supply and exhaust diffuser for heating, ventilating and cooling. Especially designed for use where simplification of ductwork is desirable.
Model TH 	6" 14" 8" 16" 10" 18" 12" 20"	Primarily for ceiling application but can also be used on sidewall.	A half round supply air diffuser with removable inner cone assembly for quick, easy mounting. Adjustable — on the job — by simply removing inner cone assembly and adjusting screws to air pattern desired. Equally efficient for heating, cooling, ventilating.
Model TMS 	4" 10" 5" 12" 6" 14" 8" 16" 18"	For exposed ductwork or flush mounting.	A square diffuser designed to deliver supply air for heating, ventilating, cooling in a 360° pattern. Blank-off baffles available to supply a wide variety of other air distribution patterns. Ingenious spring lock arrangement permits quick, easy removal and installation of inner assembly.

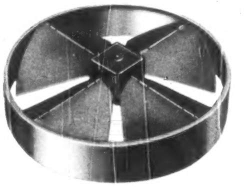
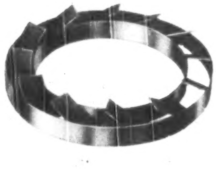
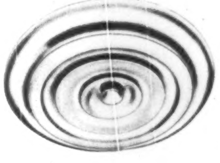
- Also available but not pictured is TITUS Model TL CEILING DIFFUSER (supply air diffuser combined with attractive lighting fixture). Write for literature

TITUS CEILING DIFFUSERS ARE:

A. Furnished in beautiful metalescent aluminum finish.
(Unless otherwise specified)

B. Individually packaged in sturdy damage-proof cartons.

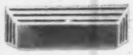
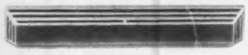
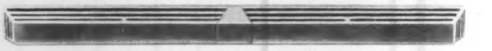
DIFFUSERS AND ACCESSORIES

	FOR USE WITH DIFFUSER MODEL	DESCRIPTION
MODEL AG-65 COMBINATION DAMPER AND GRID 	TM TMS TMA T-I TL	A combination equalizing grid and damper that is quickly, easily installed in take-off. Blade opens up directly into air stream permitting precision air volume control. Installs flush with duct take-off.
MODEL AG-75 RADIAL DEFLECTOR DAMPER 	TM TMS TMA T-I TL	Four sets of gang-operated blades distribute air evenly over diffuser or duct — completely eliminating need for equalizing grids. Unique design permits the precision metering of air flow to any degree desired from full open to complete shut-off. Heavy gauge, vibration-free metal blades hold desired settings in spite of air pressure variations. Quickly, easily adjustable from face of diffuser.
MODEL AG-85 BUTTERFLY DAMPER 	TM TMS TMA T-I TL	A butterfly damper that provides the ultimate in simple, easy, economical control of air volume. Friction pivots on heavy gauge metal blades keep blades at desired setting. Can be mounted directly on diffuser. Fully adjustable from face of diffuser.
MODEL AG-85S SUPPLY DAMPER 	TR	A circular type supply damper used to distribute supply air uniformly around circumference of Titus TR combination supply and return diffuser. Also used to control volume of supply air when balancing system — and as a method for baffling unit to give correct air distribution in irregular spaces. Individually adjustable blades have friction pivots to keem them at desired settings.
MODEL AG-85R EXHAUST DAMPER 	TR	A butterfly type damper used on Titus TR combination supply and return diffusers. Easily and effectively controls volume of return air when balancing the system. Heavy gauge metal blades have friction pivots to maintain desired settings.
MODEL EG EQUALIZING GRID 	TM TMS TMA T-I TL	Used to equalize the flow of air into the neck of diffuser or duct — and to give directional control of air flow whenever needed. Features famous Titus solid metal Airfoil louvers designed to give maximum air control with minimum noise and turbulence. Individually adjustable louvers spring-tensioned to rigidly maintain desired settings — and provide silent, rattle-free performance.
MODEL CC CEILING CONE (Pictured with Model TMA Diffuser) 	TM TR TMA TL	An attractively styled, scientifically designed accessory that not only affords maximum protection to ceiling — but actually enhances appearance of diffuser unit used with it. Adapts Titus diffusers to flush mounting on exposed ductwork — or flush with ceiling.
MODEL PMR PLASTER MOUNTING RING 	TM T-I TMA TR TL	An ingenious combination plaster mounting ring and duct ring that greatly reduces cost, time, work of flush mounting. Fastens by neck to duct and serves as plaster stop. Automatically provides correct ceiling opening and centers diffuser to it. Eliminates cutting hole in plaster. Does away with extra duct-work — extra connections. Sturdy metal construction.
MODEL AG-75½ VOLUME CONTROLLER	TH	An opposed acting damper that serves as an air flow equalizer — as well as a volume control. Positive shut-off when desired.
DUCT RING	TM TR TMA T-I TL	Made of heavy gauge steel. Available for exposed duct work and other applications.
SECTORIZING BAFFLES	Specify side for baffle.	Blanking baffles available for special applications.

TITUS *Airfoil*

AIR CONDITIONING OUTLETS

TITUS PERIMETER DIFFUSERS

	APPLICATION	FEATURES
 **MODEL 50** **17" LENGTH**	For use in bathrooms or areas not requiring higher volume air delivery and where minimum space available. May be installed on inside or outside walls.	For heating and cooling. Built-in damper with set lock. Baffles provide 180° air diffusion. One boot size for all models. 17" x 4" x 2¼". 19" free area. Metallic hammer-tone finish.
 **MODEL 100** **30" LENGTH**	For normal size rooms where it provides greater air volume in broad diffusion pattern. Should be centered on exposed wall or under large window areas.	Same as above except dimensions 30" x 4" x 2¼". 33" free area.
 **MODEL 150** **60" LENGTH**	Consists of two No. 100 diffusers joined with clip. For coverage of large wall areas with extreme air volume. Mostly used for industrial applications or large picture windows.	Same as above except dimensions 60" x 4" x 2¼". Free area — 62".

NOTE: Each Titus Perimeter Diffuser is individually packaged in strong, damage-proof carton.

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TITUS MANUFACTURING CORP. . . . . WATERLOO, IOWA

LITHO IN U.S.A.

How it Works!

Only new Sarco TD steam trap uses kinetic energy of steam to close valve

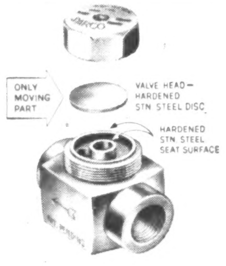
GAS MANTLES have been replaced by electric lights, steam locomotives by diesels, propeller planes by jets.

Now, the use of the kinetic energy of steam principle gives us a modern type of steam trap.

The Sarco TD obsoletes all other types for most 10 to 600 psi installations. For example, it operates without a valve closing device—no bucket, float, bellows, pins, levers or gaskets.

Glance below and you'll agree that no other steam trap is even similar to the Sarco TD!

For a trial installation—write today.


ONLY MOVING PART
VALVE HEAD—HARDENED STN STEEL DISC
HARDENED STN STEEL SEAT SURFACE

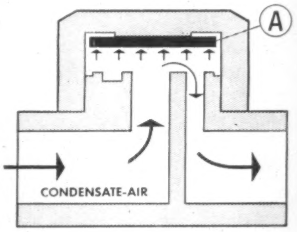
Only 3 parts . . . all stainless steel

Sizes ⅜ to 1"—each body is as small as a tee fitting! Capacity is determined not by a bulky body but by the effective orifice, valve action, pressure drop and condensate temperature.

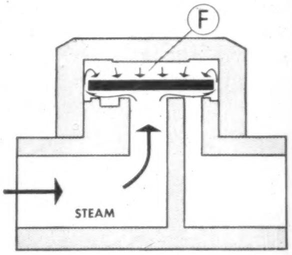
Many Advantages

1. *Practically no maintenance*—no valve mechanism, no narrow channels. Trouble-free simple design. Only 3 parts—all stainless steel.
2. *One trap for all pressures*—self-adjusting. One large capacity seat for 600 psi as for 10 psi. No changes or adjustments.
3. *Operates equally well on all loads*—on heavy, light or no condensate load. No prime to lose. No adjustments.
4. *No steam leak required*—to operate the Sarco TD. Closes tight against steam.
5. *Discharges at steam temperature and vents air* and air-steam mixtures at start-up and during operation.
6. *Freeze-proof*—when installed with outlet down, free to drain

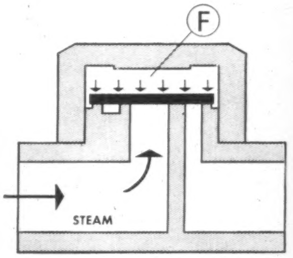
Only Sarco TD Thermodynamic Steam Trap Uses This Unique Operating Principle Which Permits Trouble-Free TD Design



1. Inlet pressure raises disc "A" from seat... immediate discharge of air and condensate at steam temperature.



2. Steam follows the condensate and the high velocity jet across the bottom of disc "A" creates a low pressure area (Bernoulli effect)... the jet is deflected into chamber "F" where it builds up pressure by recompression and this pressure acts on the top of the disc "A"...



3. Pressure in chamber "F", acting on full top area of disc "A", exceeds force of incoming steam and low pressure area under the disc... and immediately forces it down, closing the inlet. As condensation decreases the pressure in chamber "F", the disc rises and steps 1 or 2 repeat.

60-day trial convinces . . . No obligation . . . Use coupon!

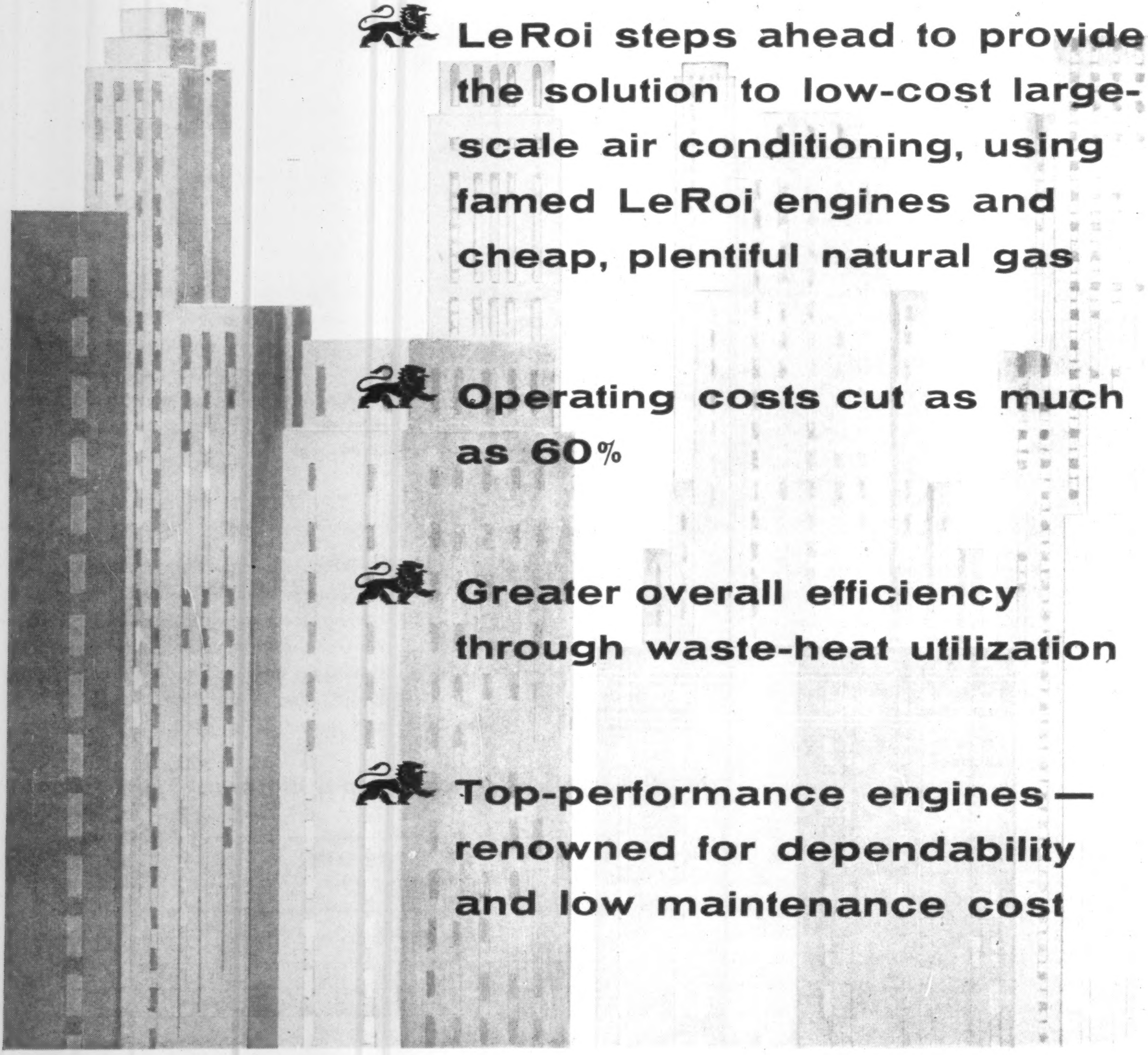
SARCO

Steam Traps—Temperature Regulators—Strainers—Heating Specialties

SARCO COMPANY, INC., Empire State Bldg., New York 1, N. Y.
Please send me Sarco TD Steam Trap and strainer for 60-day trial. Size________
For installation on________
Name________ **Title**________
Firm________
Address________
City________ **State**________
2184-C

New economical

for major



- LeRoi steps ahead to provide the solution to low-cost large-scale air conditioning, using famed LeRoi engines and cheap, plentiful natural gas
- Operating costs cut as much as 60%
- Greater overall efficiency through waste-heat utilization
- Top-performance engines — renowned for dependability and low maintenance cost

source of power air conditioning

(75 HP AND UP)

High operating costs have always been the major factor whenever the installation of larger air-conditioning plants has been under consideration.

Taking advantage of the very cheap and plentiful supplies of natural gas, as against the continually increasing cost of electricity, the installation of LE ROI gas engines as the source of power will reduce operating costs substantially, by as much as 60%.

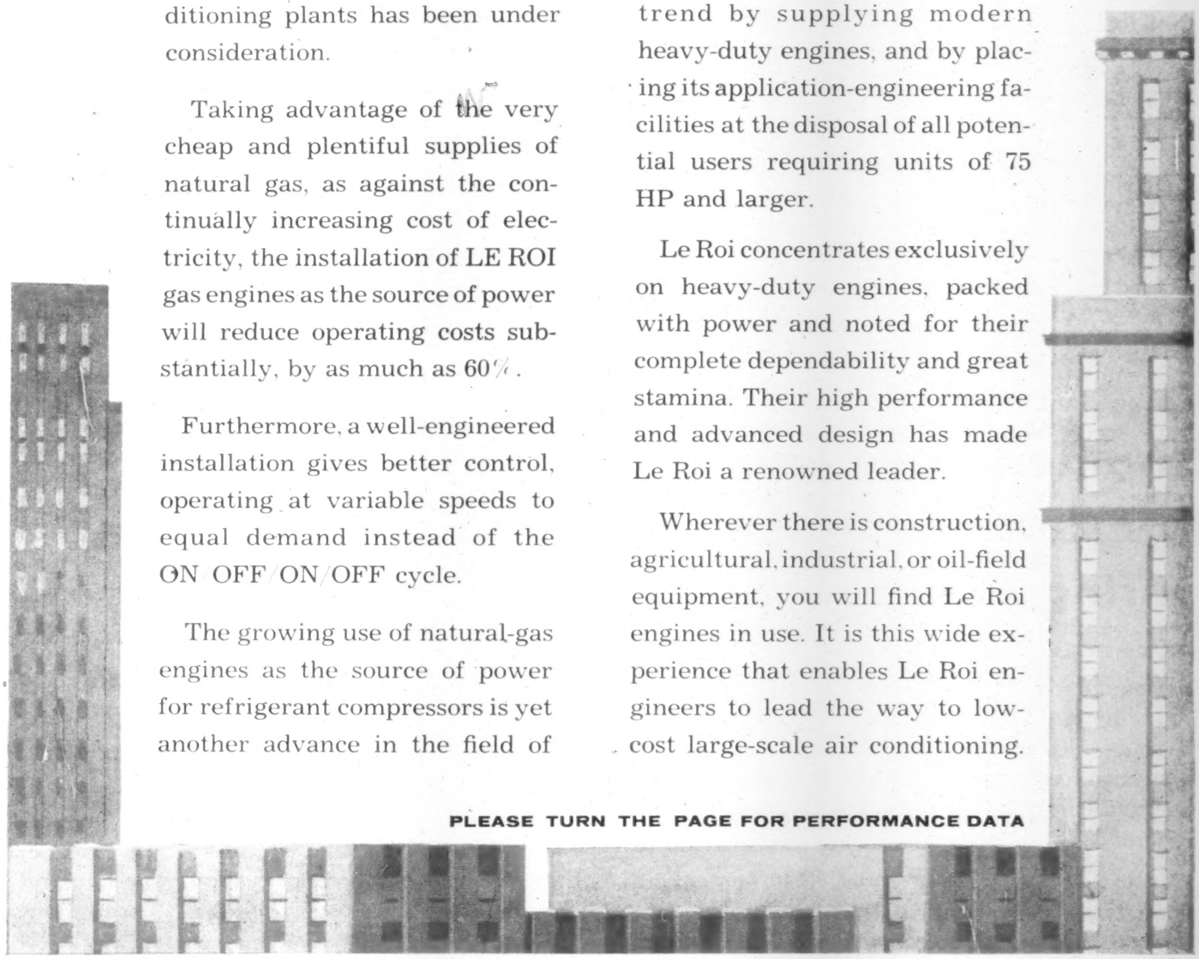
Furthermore, a well-engineered installation gives better control, operating at variable speeds to equal demand instead of the ON/OFF/ON/OFF cycle.

The growing use of natural-gas engines as the source of power for refrigerant compressors is yet another advance in the field of air conditioning. Le Roi Division of Westinghouse Air Brake Co. is playing a leading part in this trend by supplying modern heavy-duty engines, and by placing its application-engineering facilities at the disposal of all potential users requiring units of 75 HP and larger.

Le Roi concentrates exclusively on heavy-duty engines, packed with power and noted for their complete dependability and great stamina. Their high performance and advanced design has made Le Roi a renowned leader.

Wherever there is construction, agricultural, industrial, or oil-field equipment, you will find Le Roi engines in use. It is this wide experience that enables Le Roi engineers to lead the way to low-cost large-scale air conditioning.

PLEASE TURN THE PAGE FOR PERFORMANCE DATA



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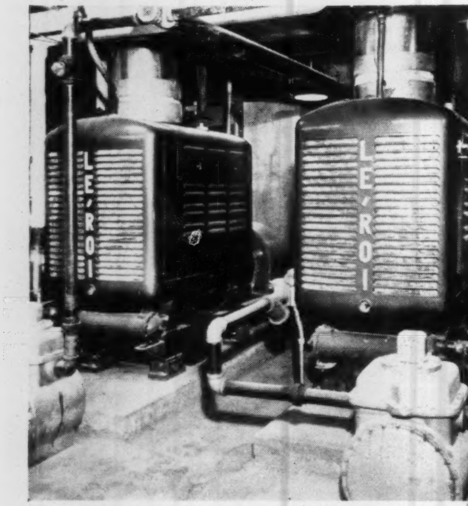
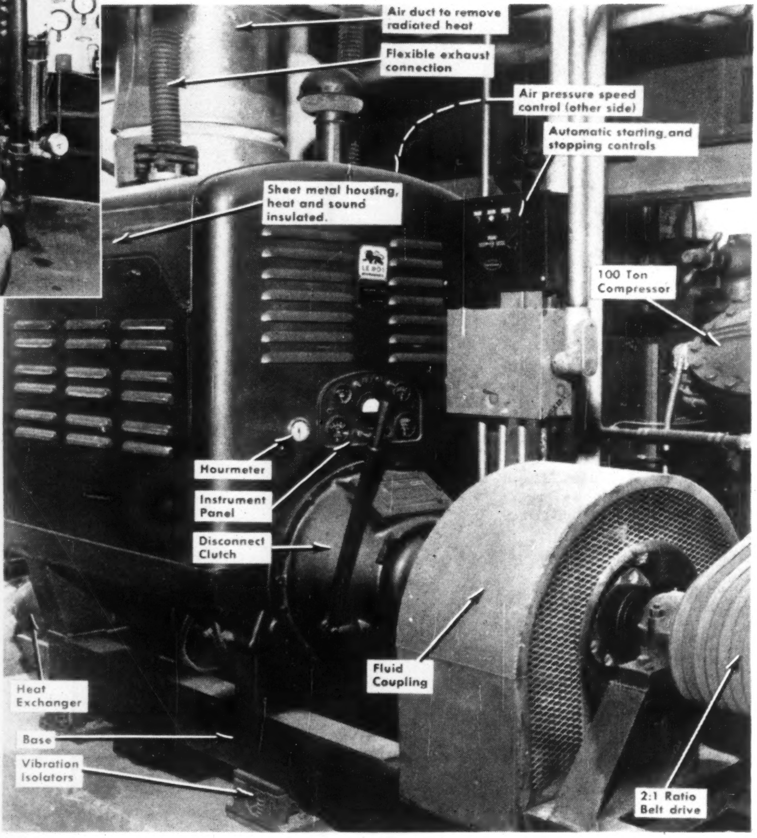

LE ROI
LE ROI


Air duct to remove radiated heat
Flexible exhaust connection
Air pressure speed control (other side)
Automatic starting and stopping controls
Sheet metal housing, heat and sound insulated.
100 Ton Compressor
Hourmeter
Instrument Panel
Disconnect Clutch
Fluid Coupling
Heat Exchanger
Base
Vibration Isolators
2:1 Ratio Belt drive

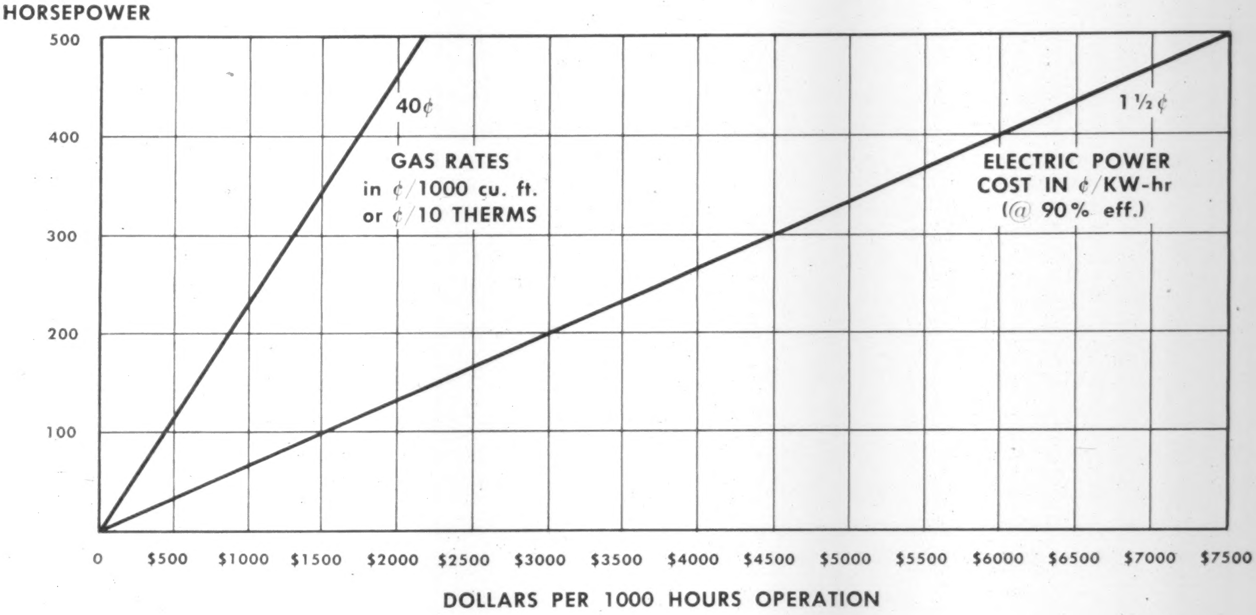
These two Le Roi H540 engines are fitted with fully automatic starting and speed controls. The engines operate unattended day and night. Vibration isolators and insulation, coupled with the fine balance of the H540, hold engine noise and vibration levels low.

Engines save owner $6,000 in air-conditioning operating cost during first season

Last summer's saving of $1.50 per hour for 4,000 engine-hours dramatically illustrates the economy of using gas engines to drive air-conditioning refrigerant compressors. This was the actual saving made by the Ohio Fuel Gas Company of Columbus, Ohio.

Using two Le Roi V-8 model H540 engines to power two 100-ton reciprocating compressors, the company air-conditioned their office building last summer for the equivalent energy cost of .8¢ per KW-hour . . . less than one-half of the prevailing electrical power costs for the area!

The initial cost of the installation is reported by the owners as only 5% higher than for electric motors and starting equipment. In addition, there are no costly major supply or demand charges for power to worry about throughout the year.



Comparison of gas-engine and electric costs

This graph clearly shows the great economies to be gained by the use of natural gas.

Taking an average gas rate of 40¢/1,000 cu. ft. against an average of 1½¢/HP-hr. electricity at 500 HP, the cost of gas per 1,000 hours of operation is only $2,200 — whereas purchased power for the same period would amount to over $7,500 — almost 3½ times as much!

In nearly every area throughout the country, gas rates are substantially lower than equivalent electric rates. Local gas suppliers should be consulted for exact rate schedules applicable to a given load, also for the effect combined loads will have on rates during the summer season.

Some basic questions answered

The use of gas-engine power for air-conditioning installations is a revolutionary advance. It offers, in almost all areas of the United States, overwhelming operating-cost savings. Because it is a great advance in this field, Le Roi has prepared the following answers to the basic questions which are most frequently asked by consulting engineers, owners, and installers.

(Q) Why use gas engines?	(A) Lower operating cost plus improved performance. Initial cost is usually within 10% of the combined cost of electric motors, starters and associated equipment.
(Q) Do engines lend themselves to heat pump and waste heat recovery applications?	(A) Yes. For every horsepower developed by the engine, the equivalent of 1½ horsepower is recoverable from the jacket water and exhaust gas. This suggests very attractive possibilities for heat pump drives and domestic hot-water heating..
(Q) What size units can use engines?	(A) Le Roi engines suitable for this service start at about 75 HP and go up to 500 HP in single drives. 50 KW to 350 KW gas-engine generator sets can also be used to power pumps and air-handling equipment or remotely located electrical units.
(Q) Is natural gas a good fuel?	(A) Definitely! It is a clean fuel already in its gaseous state. It burns smoothly and does not leave deposits as other engine fuels do. Octane rating is higher than for most gasolines.

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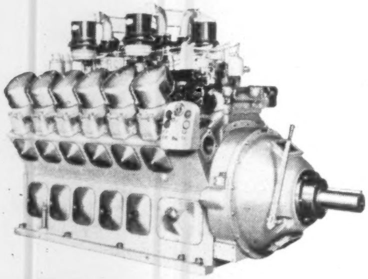
(Q) What about noise and vibration?	(A) With the Le Roi engines specified for this service, a well-engineered installation presents no real problems. Le Roi engineers will provide detailed instructions and guidance for contractors, thus insuring that correct installation reduces noise and vibration to a minimum. The noise and vibration level is between that of electric motors and that of reciprocating compressors.
(Q) What are the disadvantages?	(A) Higher maintenance costs, more attention by operator, provision to suppress noise and vibration. But . . . maintenance costs and brief daily attention during operation become minor factors against the economical advantages of gas engines over electric motors.
(Q) How about space?	(A) An engine drive does take up more space, but again, the cost savings are so great that this factor, too, becomes of relatively little importance.
(Q) How much attention is required?	(A) A daily check of water, oil, and general operating conditions is usually adequate. Engines equipped with variable-speed control need only be started and stopped by the operator. Fully automatic controls can be applied to automatically stop and start the units so that no attendant is necessary. Safety switches shut down the engine on low oil pressure, high water temperature, or malfunctioning of compressor.
(Q) How much gas do they use?	(A) Without knowing speed and load conditions, an exact figure cannot be given. A sound, conservative rule-of-thumb is 10-12 cubic feet of 1,000 BTU/cubic foot gas per horsepower/hour, for any Le Roi engine used in air-conditioning service.
(Q) What extra provision must be made for an engine?	(A) The space occupied by a 75- to 200-HP unit is about 3½ x 5 feet, and 4 x 10 feet for the 400- to 500-HP unit. Cooling capacity of about 60 BTU/HP/min. is required for engine-jacket water — around 25% more cooling tower capacity than normally required. Engine exhaust must be run to the outside or chimney. Starting system requires battery, AC current, or air.
(Q) Why are **Le Roi** Engines best suited for large-building air conditioning?	(A) Le Roi heavy-duty gas engines represent the first truly new design concept in 15 years. Designed specifically for heavy-duty industrial work, they are compact high-output engines of V-type construction. Short stroke gives greater horsepower, higher speed, and less vibration. All accessories have been rigorously tested and proved in actual service. Le Roi has more experience in air conditioning than any other large engine manufacturer.
(Q) What kind of compressors can be engine-driven?	(A) Slow-speed reciprocating compressors can be driven through a reduction gear on the engine, or with belt drive. 1200- or 1800-RPM compressors in the 75- to 150-ton class can be direct-driven. Centrifugal compressors can be driven through speed increasers.

To meet a wide range of load requirements, Le Roi provides a number of models with horsepower ratings from 75 HP to 500 HP.

Modern short-stroke design means piston speeds as much as 80% lower than for comparable units, with a tremendous reduction in engine wear. The 75-200 HP engines are enclosed in sturdy housings and all the engines have smooth, simple lines, easy to keep clean. Their appearance is an asset to any plant or installation.



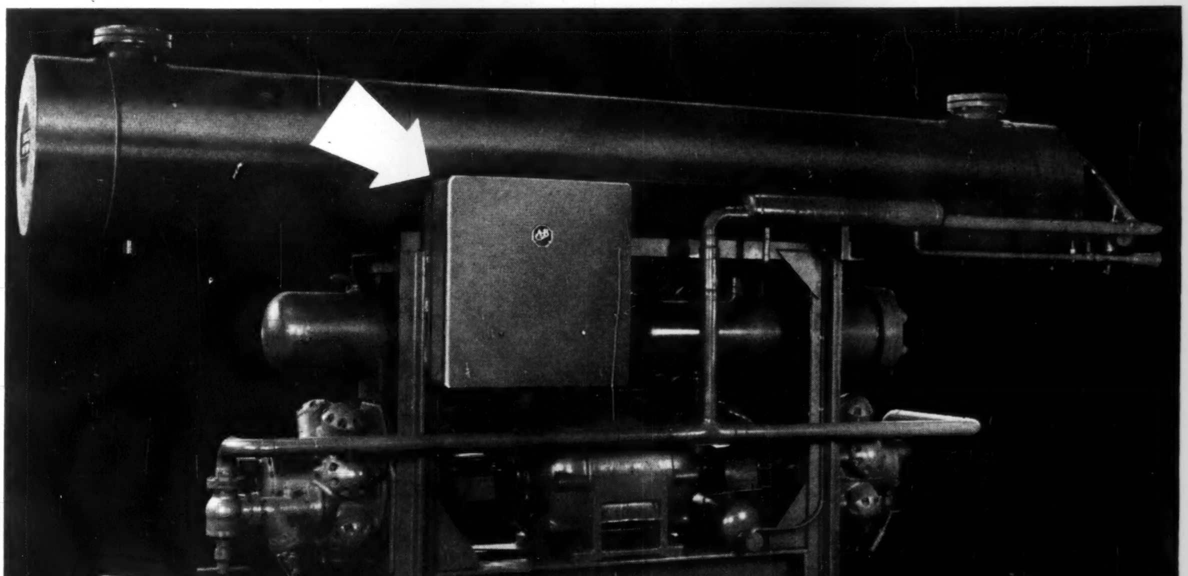
The L3460 — a typical Le Roi Heavy-duty Industrial Gas Engine. Its short-stroke V-12 design develops 500 HP.

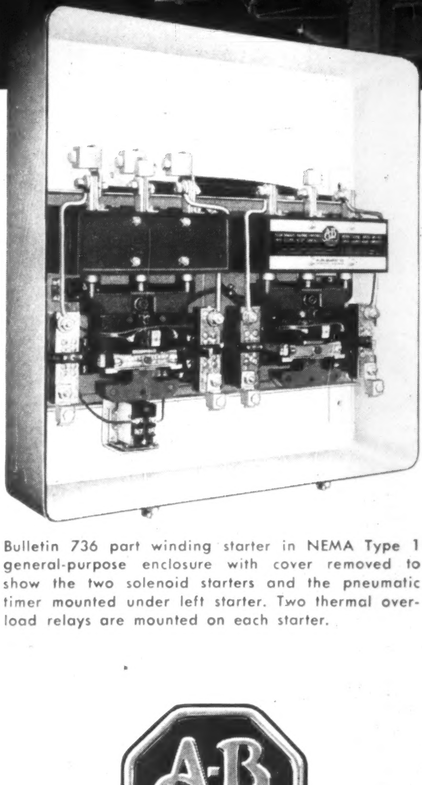
Le Roi engines give you high performance with low operating and maintenance costs.

Le Roi engineers offer you the benefit of their wide, accumulated experience.

Write us today for engine specifications, data sheets, and general literature covering Le Roi engines . . . the new source of power for 75-HP and larger air-conditioning installations.

LE ROI Division of Westinghouse Air Brake Co.
MILWAUKEE 1, WISCONSIN





Bulletin 736 part winding starter in NEMA Type 1 general-purpose enclosure with cover removed to show the two solenoid starters and the pneumatic timer mounted under left starter. Two thermal overload relays are mounted on each starter.

THE POWER COMPANY IS SATISFIED!

Airtemp Water Chiller Accelerates Smoothly with Part Winding Motor and A-B Part Winding Starter

Manufacturers of large refrigeration and air-conditioning installations frequently are confronted with power company motor starting current limitations to reduce line voltage drop and eliminate light flicker. The part winding motor with its special starter may be a low cost answer for such a requirement.

The motor is accelerated for a preset interval determined by the Bulletin 849 pneumatic timer mounted on the Bulletin 736 part winding starter. Thereupon, the second winding of the motor is connected in parallel across the line. The motor then goes to full speed and torque without line disturbance.

Allen-Bradley Bulletin 736 starters are available for 2-step starting of motors up to 200 hp, 220 v; 400 hp, 440-550 v. They can also be furnished for 3-step starting up to 200 hp, 220-440-550 v. Write for the Allen-Bradley Handy Catalog.

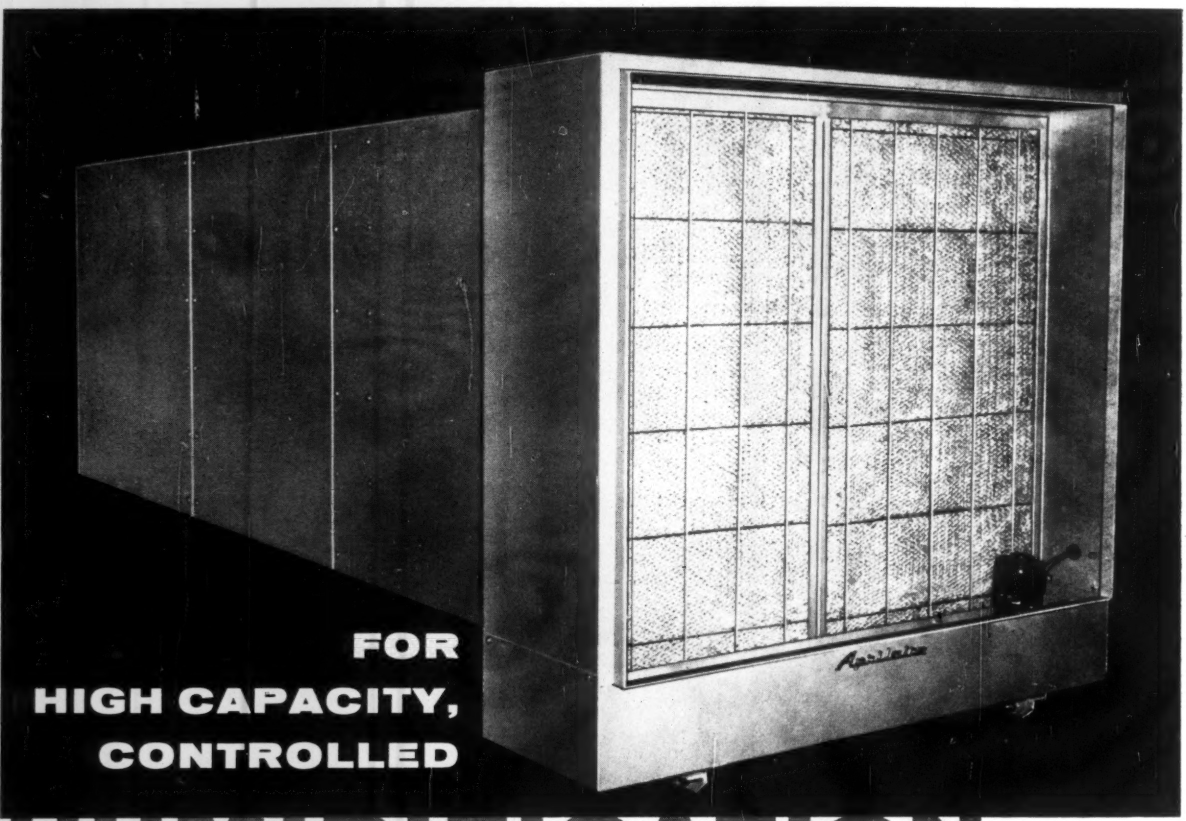
Allen-Bradley Co.
1335 S. First St.
Milwaukee 4, Wis.

In Canada—
Allen-Bradley Canada Ltd.
Galt, Ont.

A-B
Quality

The Sign of QUALITY Motor Control

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY



FOR HIGH CAPACITY, CONTROLLED HUMIDIFICATION

RP *Aprilaire*

AUTOMATIC-ELECTRIC HUMIDIFIERS

HIGH CAPACITY

Aprilaire Industrial Humidifiers (illustrated) are designed to provide capacity for practically any size requirements. Unit sizes up to 10 G.P.H.—can be installed singly or in a series of any number of units.

POSITIVE CONTROL

The Aprilaire introduces relative humidity as needed ...and only when needed. Automatic control eliminates possibility of lag or over-run.

FLEXIBILITY

Aprilaire industrial models are available for gas, steam or hot water heat source. Every model can be pedestal-mounted or suspended—according to individual requirements.

BACTERIA REMOVAL

The Aprilaire's entirely new principle of humidification, introducing humidity as a water vapor, provides an important plus feature—the removal of up to 70% of all bacteria in the air stream circulating through the unit.

ISOTHERMAL OPERATION

The Industrial Aprilaire has no temperature effect on the humidified air. Exhausted, humidified air is discharged at the same temperature it enters the unit.

MINIMUM MAINTENANCE

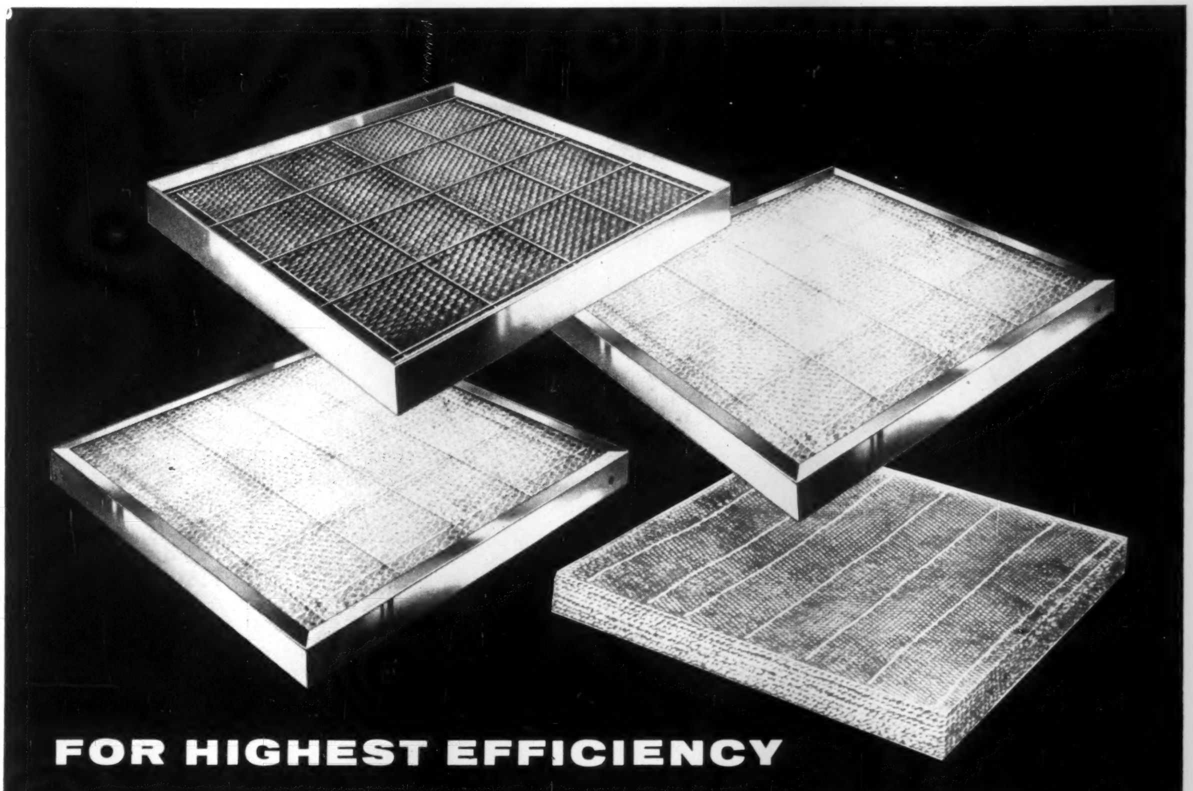
Because the only liming or water solids deposits occur on the inexpensive, replaceable evaporating pads... mechanical difficulties from these usually troublesome deposits are eliminated.

INDUSTRIAL AND RESIDENTIAL MODELS AVAILABLE-WRITE FOR COMPLETE INFORMATION

see our catalog in
S
PLANT ENGINEERING FILE
or write for copy

RP ... PRODUCTS OF RESEARCH

RESEARCH PRODUCTS *Corporation*
Dept. 912, Madison 10, Wisconsin



AIR FILTRATION

RP AIR FILTERS

FOR RESIDENTIAL, COMMERCIAL,
INDUSTRIAL APPLICATIONS

EZ KLEEN

The aluminum, washable air filter that features easy cleaning and moderate cost. Standard E Z Kleen in ½″, 1″ and 2″ thicknesses—350 F.P.M. rating. Multi-Velocity E Z Kleen in 1″ and 2″ thicknesses—520 F.P.M. rating. Easily washed and re-coated with Filter-Coat (dust and dirt removing adhesive) or Super Filter-Coat (dust and odor removing adhesive) for like-new efficiency.

GREASE FILTER

Aluminum grease filters for kitchen exhaust systems. End grease nuisance and resulting costly maintenance to motor and blower equipment...reduce fire hazard ...increase sanitation. Attractive aluminum improves kitchen appearance. Strong, lightweight, easy-to-handle.

INDUSTRIAL FILTER

Economical, lightweight, easy-to-clean, aluminum filters for both high or low velocities. Reduce operating costs through longer service life and top performance. Ideal for new or existing installations.

PAINT ARRESTORS

Inexpensive, disposable filter pads that remove paint overspray solids from exhausted air in paint spray booths. Simple installation, using holding frames, in banks of any size. R P Paint Arrestors are efficient in operation...versatile...economical in operating and initial costs...save floor-space...reduce down-time.

WRITE FOR COMPLETE INFORMATION

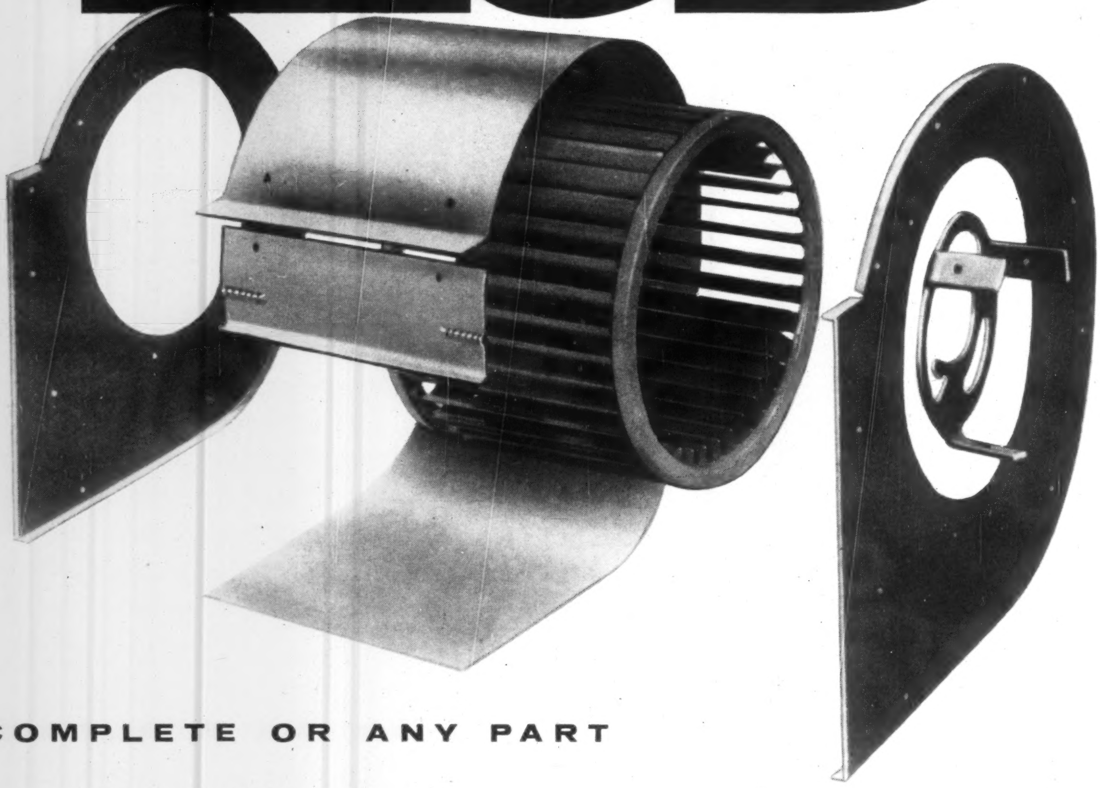
RP ... PRODUCTS OF RESEARCH

RESEARCH PRODUCTS *Corporation*

Dept. 46, Madison 10, Wisconsin

MORRISON CUSTOM DESIGN

MCD



COMPLETE OR ANY PART

Because of the various Morrison Blower Designs and the many component parts that go into the making of complete assemblies, M.C.D.° offers you blowers that are practically designed individually for your furnace and air conditioning units.

Meeting every requirement of space and function, overcoming all the limitations of stock blowers, M.C.D.° makes it possible for you to obtain quality produced blowers built and designed specifically for your products.

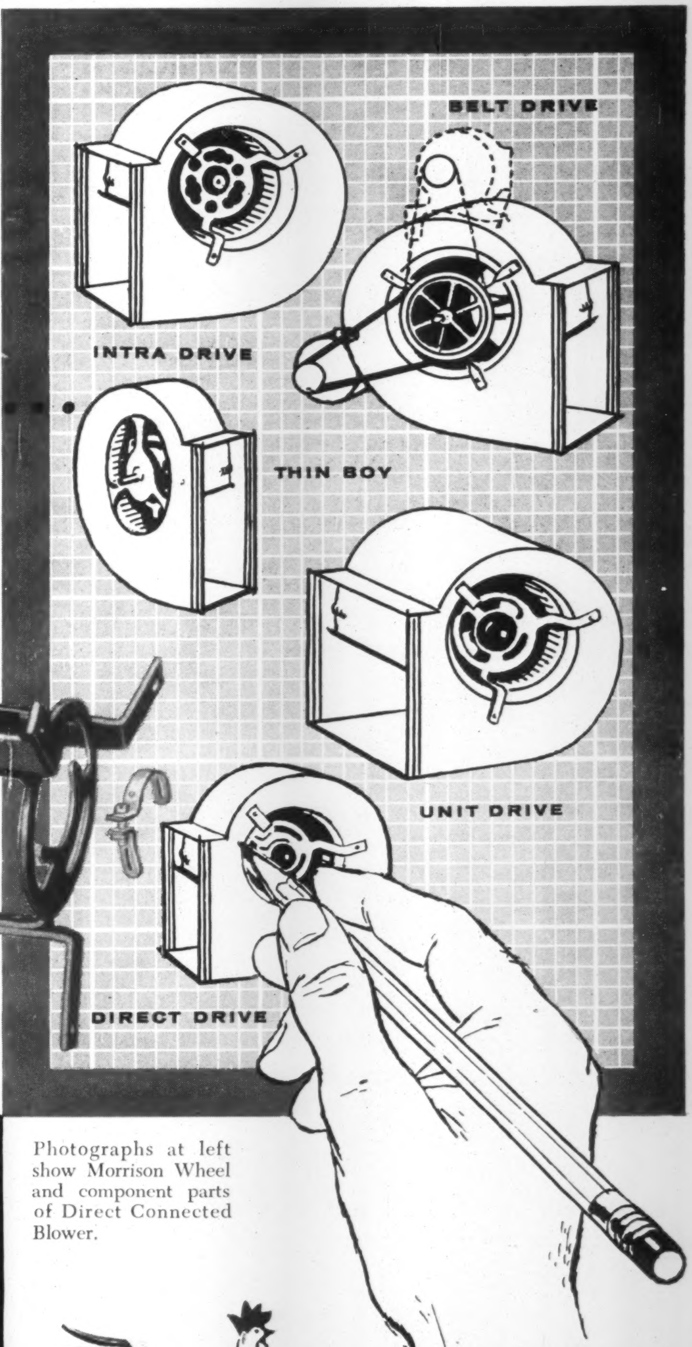
In addition to this, substantial savings are assured by the combination of standard parts produced in volume.

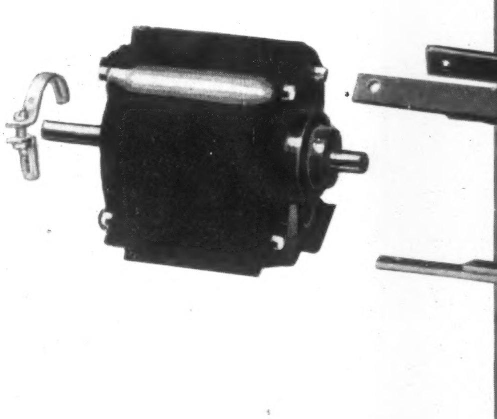
Morrison engineers will be happy to work with you — as they have with most of the leading Heating and Air Conditioning Manufacturers — for perfect distribution of air in your equipment.

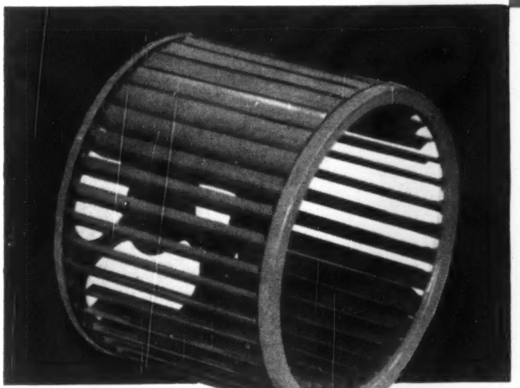
Write us today — tell us of your problems — and see if we can show you a simple "out".

MORRISON PRODUCTS

individualized and stylized for your particular need . . .


BELT DRIVE
INTRA DRIVE
THIN BOY
UNIT DRIVE
DIRECT DRIVE





Photographs at left show Morrison Wheel and component parts of Direct Connected Blower.

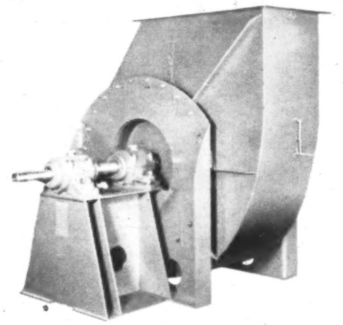
Be sure to visit us at the International Heating and Air Conditioning Exposition Chicago Feb 25 to March 1st

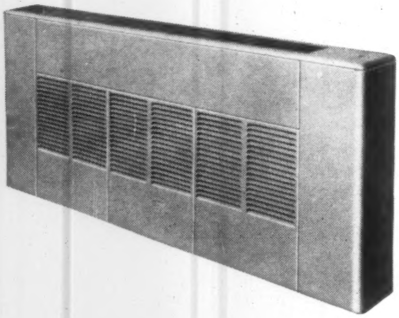
Booth 936

INCORPORATED

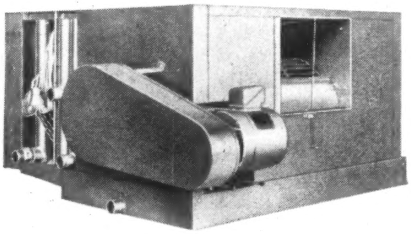
16816 Waterloo Road
Cleveland 10, Ohio

Sirocco® High-Pressure Fans are part of the complete American Blower package for high-velocity, high-pressure air-handling systems.

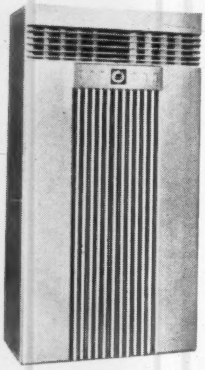




Planning a peripheral system? Compact American Blower Inductor Units can be mounted vertically or horizontally.

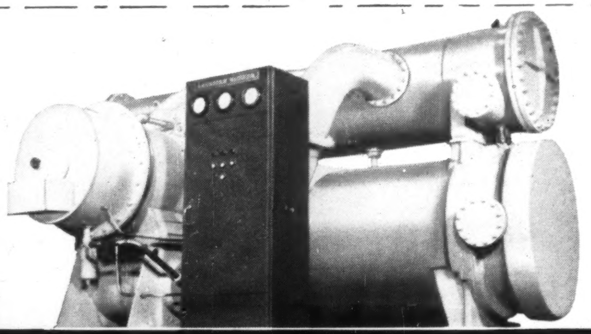


American Blower Type A Conditioners provide control of summer cooling and winter heating for central-station air-conditioning systems.

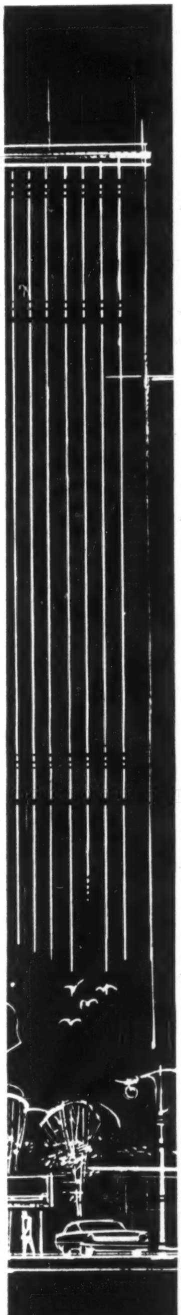


American Blower Packaged Air Conditioners are self-contained units that cool, filter, dehumidify, circulate. For stores, showrooms, factories. Sizes 3 to 20 tons.

Planning a central-station system? American Blower Tonrac* Centrifugal Refrigerating Machines maintain constant chilled-water temperature regardless of load. One-level construction saves weight, space, installation costs.



*TRADEMARK



Here's how you benefit when you select all your air-conditioning components from American Blower's complete line:

American Blower cooling, heating, air-handling and air-conditioning products are designed, engineered, manufactured to work together!

When choosing air-conditioning equipment — for a large-scale central or zone system, or a system for a smaller store, showroom or industrial plant — it pays to select from one source. A single source pinpoints responsibility for quality, performance, delivery dates . . . saves time and money.

Complete line fits all requirements

The components shown opposite are only a few of the complete line of American Blower quality air-conditioning products, designed, engineered and manufactured to work together. Refrigerating machines, heating and cooling coils, central-station air-conditioning units, multi-zone conditioners, inductor units, sprayed-coil dehumidifiers, self-contained air conditioners, heavy-duty fans, equipment for heating, cooling, dehumidifying . . . whatever your needs, specify American Blower for undivided responsibility!

Expert service before, during and after the sale

The more than 300 skilled American Blower factory and sales engineers in all parts of the country are at your service. Each has the know-how and experience to help you select and apply the exact American Blower equipment you need. And what's more, they'll follow-through during and after the installation to ensure your satisfaction.

Performance-proved by 75 years' experience

American Blower's 75 years' experience as a leading producer of air-conditioning, air-handling, cooling and heating products is your guarantee of a successful installation every time, and your client's assurance of years of trouble-free air conditioning. American Blower products have proved dependable in thousands of important installations in all parts of the world.

Get in touch with our nearest branch office for full information, or write: American Blower Division of American-Standard, Detroit 32, Mich. In Canada, look for Canadian Sirocco products.

See our exhibit, Booths 22 and 26, at the 13th International Heating and Air Conditioning Exposition, International Amphitheater, Chicago, Illinois, February 25 through March 1, 1957.

AMERICAN BLOWER

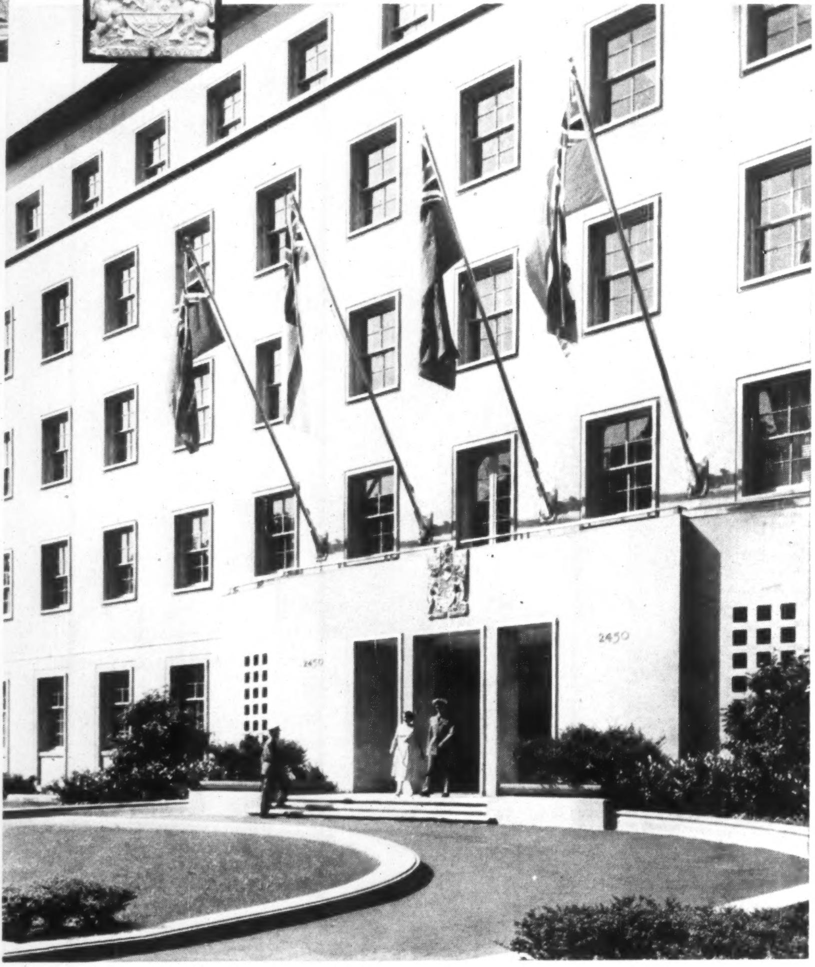
Division of **American-Standard**

AMERICAN-Standard PRODUCTS

AIR-CONDITIONING EQUIPMENT FOR EVERY BUSINESS

POWERS Control provides

CANADIAN JOINT STAFF BUILDING
Washington, D.C.

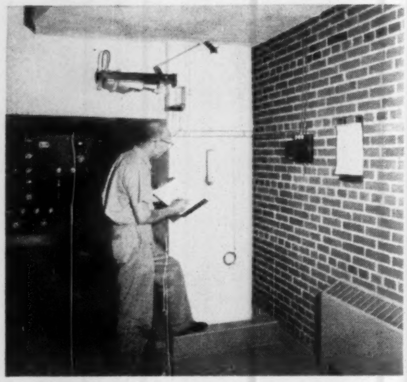


Architects:
Marani and Morris, Toronto, Ont.

Associate Architects:
Faulkner, Kingsbury and Stenhouse
Washington, D.C.

Mechanical Engineer:
Charles S. Leopold, Philadelphia, Pa.

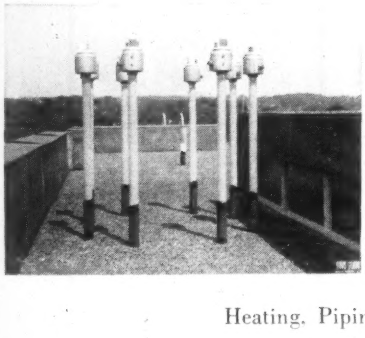
Mechanical Contractor:
W. G. Cornell Co., Inc., Washington, D.C.

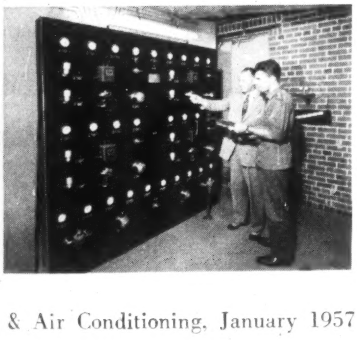


Primary air supply regulated by Sub-master Thermostat and Powerstroke damper motor.

Far Right: Powers Master Control Panel

Electronic Solar Sensing Instruments on roof of building →

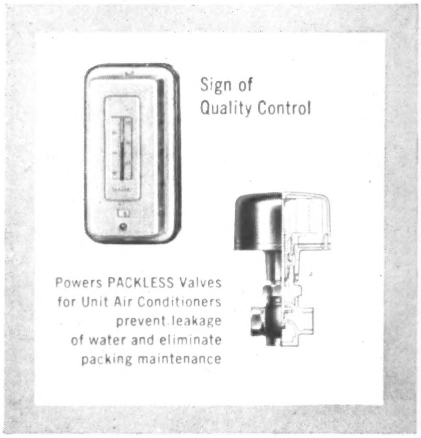




(c86)

ideal comfort in Canada's Washington "Pentagon"

This imposing new structure on Washington's Embassy Row, houses offices of the Canadian Joint Staff and Department of Defense Production. An atomic bomb shelter here provides working facilities for key personnel in time of an emergency. Teletype lines from the communication room link the building with both the U.S. Pentagon and Ottawa. A Powers modern control system maintains the proper air conditioned "climate" so essential for people making vital decisions. It also insures efficient operation of heating and air conditioning equipment.



Sign of Quality Control

Powers PACKLESS Valves for Unit Air Conditioners prevent leakage of water and eliminate packing maintenance

Economy in Refrigeration Horsepower achieved here. Conditioned primary air is supplied to 199 perimeter induction air conditioning units. Cooling for four exterior zones is automatically established by Powers electronic type solar equipment which measures solar gain on each exposure of the building. Operating in conjunction with a Master outdoor temperature thermostat, this equipment establishes the highest allowable temperature to meet load conditions. This control results in maximum economy of refrigeration horsepower. Perimeter induction units are individually controlled by Powers thermostats and packless valves.

Interior areas are supplied with conditioned air which is reheated as required by 23 booster coils individually controlled by Powers thermostats and packless valves. Temperature of forced hot water for the booster coils is controlled by a Powers Mastrol system.

Are You Planning a New Building or modernizing an old one? If so, ask your architect to include a Powers Quality system of temperature and humidity control. They have been time-proven dependable and more economical in thousands of prominent buildings since 1891.

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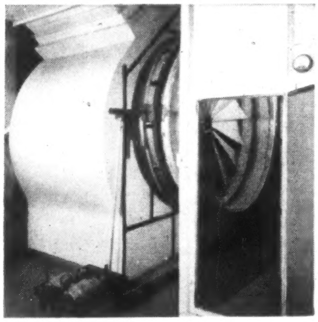
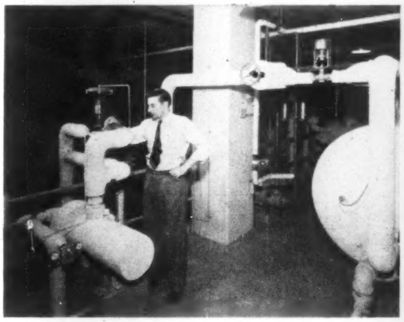
SKOKIE, ILLINOIS | *Offices in Chief Cities in U.S.A., Canada and Mexico*

65 Years of Automatic Temperature and Humidity Control

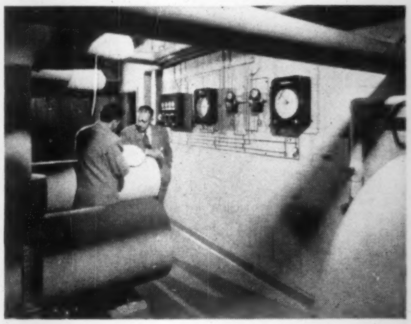
Vortex damper operated by Powerstroke Motors regulated by Powers Static Pressure Control



Powers controls on domestic hot water supply



Powers MASTROL system for forced hot water heating



Monarch
SPRAY NOZZLES

for AIR WASHERS . . . COOLING TOWERS

These are "non-clogging" nozzles with a single large tangential lead hole to the swirl chamber that will never clog from any impurities small enough to pass through the orifice. Swirl chamber is conical on both ends and pivots liquid like a top to produce an exceptionally fine, evenly distributed, balanced spray of about 80° included angle. Wider spray angles up to 130° can be furnished to order.

Standard material Brass. Also available in Stainless Steel and Monel. Pipe sizes from 1/8" to 1". 1/4" size is 1-5/16" long and made from 5/8" square stock.

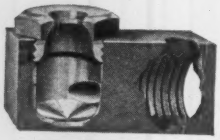


Fig. 631

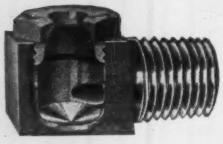


Fig. 629

CAPACITIES: GALLONS PER HOUR

Pipe Size and Fig. No.	Orifice	Lead	OPERATING PRESSURE: LBS. PER SQUARE INCH							
			5	10	20	30	40	60	80	100
1/8" Fig. 629	69	69			2.7	3.3	3.8	4.7	5.4	6.0
	61	61			4.2	5.1	5.9	7.2	8.3	9.2
	61	53	2.7	3.7	5.3	6.5	7.5	9.2	10.5	11.8
	53	53	4.0	5.7	8.2	10.0	11.5	14.1	16.3	18.2
	49	49	5.6	7.9	11.1	13.6	15.7	19.3	22.2	24.8
1/4" Fig. 629 or Fig. 631	3/32	3/32	9.6	13.5	19.2	23.4	27.0	33.0	38.4	42.9
	1/8	3/32	12.2	17.3	24.4	29.9	34.6	42.4	49.0	54.9
	1/8	7/64	14.6	20.6	29.1	35.7	41.0	50.4	58.4	65.1
	1/8	1/8	15.9	22.5	31.9	39.2	45.1	55.2	63.7	71.5
	11/64	1/8	21.7	30.6	43.2	53.0	61.1	75.0	86.4	98.0
1/4" Fig. 629 or Fig. 631	3/16	5/32	30.5	43.2	61.1	74.9	86.4	107	122	136
	7/32	3/16	45.1	63.8	90.5	110	128	156	180	202
	13/64	13/64	54.7	77.8	108	134	155	191	217	246
	7/32	7/32	59.8	84.5	120	146	169	207	240	267

HUMIDIFIERS . . . . . . AIR CONDITIONERS

The H-261 and F-80 brass nozzles produce the finest, softest, fog-like spray possible with low direct pressure only. Popular sizes are nozzle #3.00 and #5.00 tested either 80° or 120° at 25 pounds.

All Brass construction with 120 mesh Monel screen strainers and 1/8" or 1/4" female or 1/4" male pipe connection in the F-80 and 1/4" male only in the H-261. The H-261 is 1 3/8" overall and the F-80, 1 7/8".

Fig. H-261

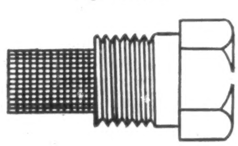
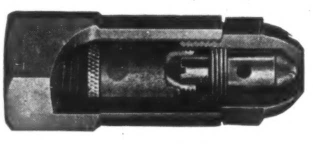


Fig. F-80 Brass



CAPACITIES: GALLONS PER HOUR

Nozzle No.	OPERATING PRESSURE: LBS. PER SQUARE INCH							
	10	25	30	35	40	60	80	100
1.35					* .57	.70	.81	.90
1.65					* .75	.92	1.06	1.18
2.00				* .87	.94	1.14	1.32	1.49
2.50			* .98	1.01	1.13	1.39	1.60	1.80
3.00		1.00	1.10	1.18	1.27	1.55	1.79	2.00
3.50		1.30	1.41	1.54	1.64	2.01	2.32	2.60
4.00		1.50	1.64	1.78	1.90	2.33	2.69	3.00
4.50		1.90	2.09	2.25	2.40	2.94	3.40	3.80
5.00		2.20	2.41	2.60	2.78	3.41	3.94	4.40
5.50		2.40	2.63	2.84	3.04	3.72	4.30	4.80
6.00		2.60	2.85	3.08	3.28	4.03	4.66	5.30
7.00		3.00	3.30	3.55	3.80	4.65	5.37	6.00
7.50	2.02	3.20	3.50	3.78	4.05	4.96	5.74	6.40
8.30	2.27	3.60	3.95	4.27	4.55	5.58	6.45	7.20

OIL BURNERS

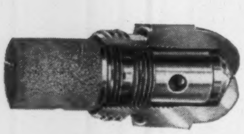


Fig. F-80
Stainless Steel

Monarch Stainless Steel Nozzles for high pressure gun-type oil burners are the Industry yardstick for nozzle performance. Each nozzle individually tested for capacity, spray angle and uniformity of spray on No. 2 fuel oil weighing 7.16 pounds per gallon at 74°F. and 34 S. S. U. viscosity at 100°F. Standard spray angles are 30°, 45°, 60°, 70° and 80° in small sizes.

Standard capacity sizes (GPH at 100 psi.): .60, .75, .85, 1.00, 1.10, 1.20, 1.25, 1.35, 1.50, 1.65, 1.75, 2.00, 2.25, 2.50, 3.00, 3.50, 4.00, 4.50, 5.00, 5.50, 6.00, 6.50, 7.00, 7.50, 8.30, 9.50, 10.50, 12.00, 13.80, 15.30, 17.50, 19.50, 21.50, 24.00, 28.00, 30.00 to 60.0 in 5.00 GPH steps and 60.0 to 100.0 in 10.00 GPH steps.

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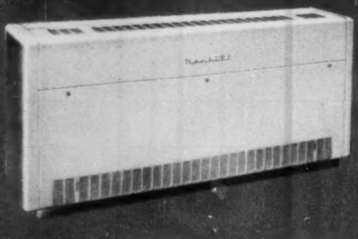

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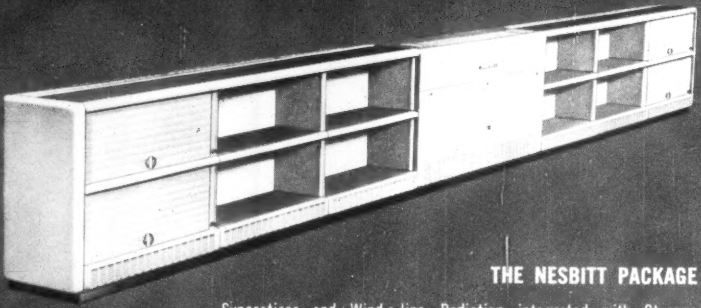
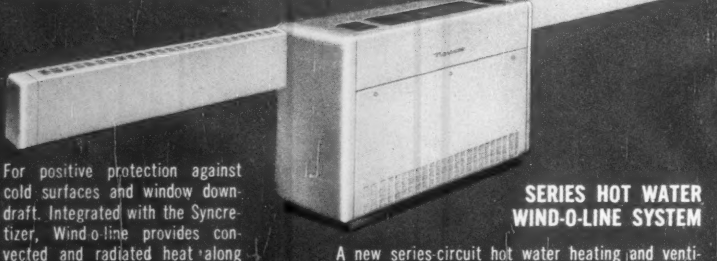
The unit ventilator that sets a new standard of classroom comfort. Four models 32" and 28" high, 750 to 1560 CFM. **Publication 100**



THE NESBITT PACKAGE

Syncretizer and Wind-o-line Radiation integrated with Storage Cabinets for classroom beauty, utility, daylong comfort and overnight protection. Ensembles 32" and 28" high. **Publication 101**

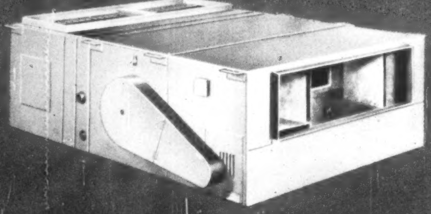
SYNCRETIZER AND WIND-O-LINE RADIATION



For positive protection against cold surfaces and window downdraft. Integrated with the Syncretizer, Wind-o-line provides convected and radiated heat along the room perimeters, achieves a symmetrical thermal environment. Capacities 450, 550, 600, 700 and 800 Btu/lin. ft. **Publication 101**

SERIES HOT WATER WIND-O-LINE SYSTEM

A new series-circuit hot water heating and ventilating system that reduces costs by eliminating pipe trenches, coverings and runouts; increases comfort and cold surface protection by use of variable water temperatures. **Publication 10-2**



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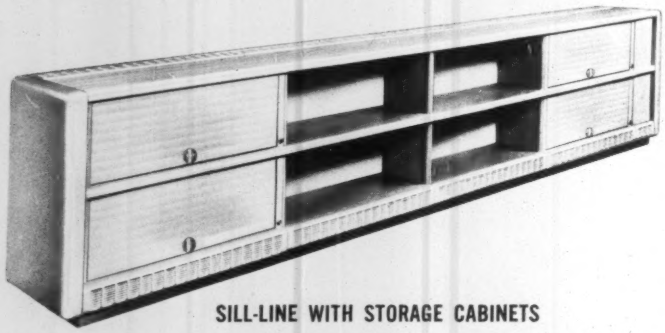
For heating and ventilating large interiors. Exclusive sound-insulated plenum. Choice of models, 1250 to 15000 CFM. **Publication 20A1**

The modern way of heating offices, schools, hospitals, churches where comfort and beauty are important

NESBITT SILL-LINE RADIATION

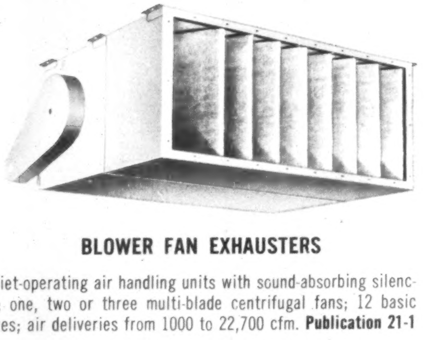
High capacity finned radiation in enclosures styled for today's interiors. Rigid, long-life construction, draft-free comfort, low installation cost. Standard lengths, approved ratings 2.9 to 12.1 sq. ft. EDR, every needed accessory. **Publication 30-1**

zoom along with the NESBITT LINE



SILL-LINE WITH STORAGE CABINETS

Combining the advantages of perimeter heating with the utility of attractive storage units at moderate cost. Ensembles 32" and 28" high, capacities 920 to 2750 Btu/lineal foot. **Publication 30-2**



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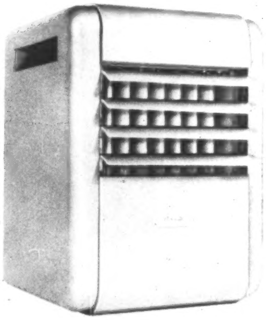
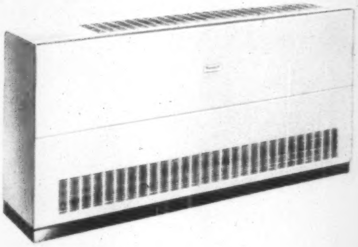
Quiet-operating air handling units with sound-absorbing silencer; one, two or three multi-blade centrifugal fans; 12 basic sizes; air deliveries from 1000 to 22,700 cfm. **Publication 21-1**



NESBITT GAS-FIRED UNIT HEATER

Seven models, 25,000 to 200,000 Btu input. A.G.A. and U.L. approved for all gases. **Publication 280**



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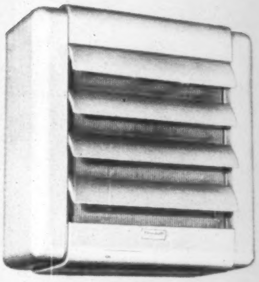
Recess, semi- or non-recess models. Steam or hot water, 107 to 618 sq. ft. EDR. **Publication 403**



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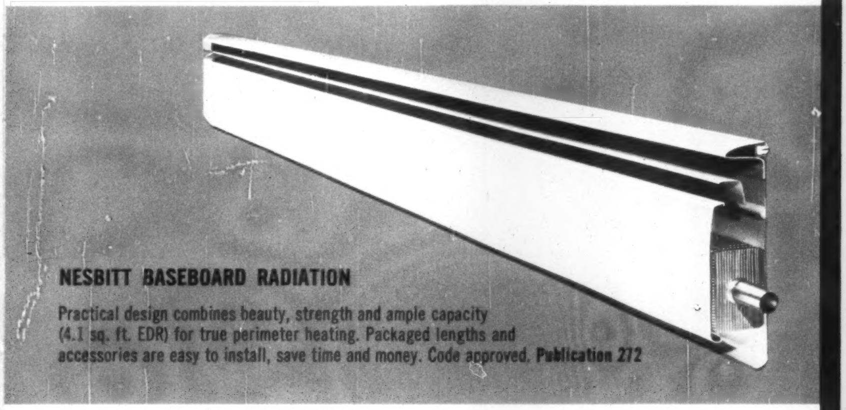
Eight sizes, 24 models; universal elements; 15,200 to 335,000 Btu/hr.; sound coded. **Publication 401**



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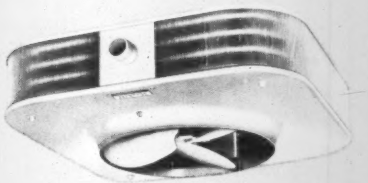
Practical design combines beauty, strength and ample capacity (4.1 sq. ft. EDR) for true perimeter heating. Packaged lengths and accessories are easy to install, save time and money. Code approved. **Publication 272**



LITTLE GIANT UNIT HEATER

Universal heating elements, 34 models; 34,000 to 684,000 Btu; IUHA sound coded. Wide choice of outlet arrangements; air patterns. **Publication 402**

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Come along, if you like a thrill; but strap in,
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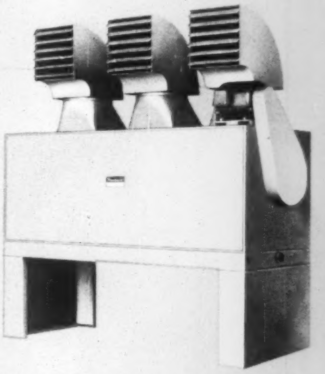
"The past is prologue"; but without those
40 take-off years there could be no break-through
such as Nesbitts plan for this and the years ahead!
You'll see changes, new items, startling action;
you'll get there with safety, pleasure, profit.



NESBITT GIANT UNIT HEATER

Heating and/or ventilating units, free or static delivery, steam or hot water. Large capacity range; 12 models; 1, 2, 3-fans. **Publication 404**

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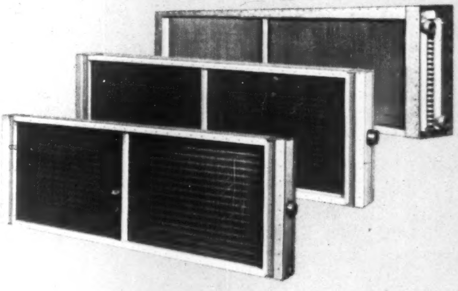
Series W water surface in types: freeze-proof WD with drain and pitched in casing, WB without drain, **246.** Cleanable WC, **255**

Series H general purpose blast coil heating surface. **Pub. 248**

Series T with Nesbitt trombone steam-distributing tubes eliminates stratification and freezing under modulated control. **305**



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GROUP 1

SCHOOLHOUSE HEATING AND VENTILATING EQUIPMENT

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BALTIMORE 18, MARYLAND	33 East 21st Street	Belmont 5-5895	MARION, NORTH CAROLINA	P. O. Box 523	4511
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BOSTON, 61, MASSACHUSETTS	70 Jaconnet Street,	Lasell 7-7100	NEW YORK CITY, NEW YORK	11 Park Place	Barclay 7-0260
BRYN MAWR, PENNSYLVANIA	765 West Lancaster Avenue	Lawrence 5-8585	ORLANDO, FLORIDA	214 Church & Main Bldg.	2-2252
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CHARLOTTE, NORTH CAROLINA	P. O. Box 1867	Edison 2-3550	PORTLAND 12, OREGON	2925 N.E. Glisan	Belmont 2-2977
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HARRISBURG, PENNSYLVANIA	835 South 13th Street	Cedar 8-8144	SPRINGFIELD, MASSACHUSETTS	Rm. 412, 1537 Main Street	Republic 2-1878
HARTFORD, CONNECTICUT	30 Gillett Street	Jackson 2-1502	SYRACUSE, NEW YORK	Rm. 1105, State Tower Bldg.	Syracuse 2-9202
HOUSTON 19, TEXAS	P. O. Box 6983, 3115 Buffalo Dr.	Jackson 9-1777	TERRE HAUTE, INDIANA	721 Prospect Street	Crawford 5931
INDIANAPOLIS, INDIANA	1531 Pennsylvania Street	Melrose 4-3463	WASHINGTON, D. C.	2523 Wilson Blvd. Arlington, Va.	Jackson 5-4714
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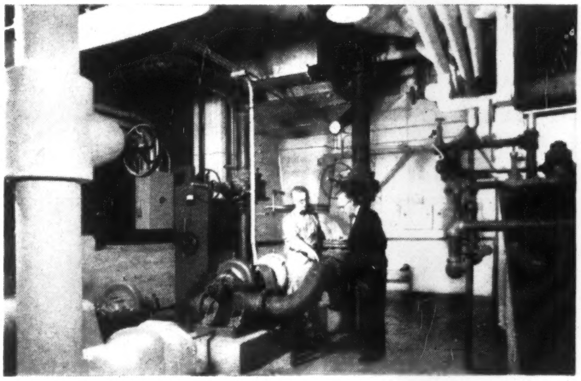
CREATING BETTER PRODUCTS FOR INDOOR THERMAL COMFORT

Nesbitt

JOHN J. NESBITT, INC., Main Office and Factory: Holmesburg, Philadelphia 36, Pa. **Telephone DEvonshire 2-2400**

Publication AP 157



Heating and air conditioning, Salt Lake City, Utah

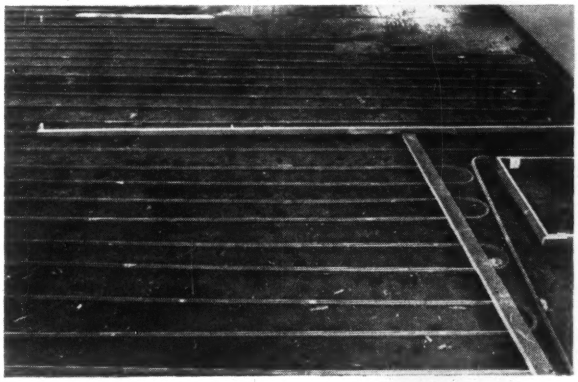
Cold storage piping, Bakersfield, California

Snow melting system, Syracuse, New York

Outdoor ice rink, Hamtramck, Michigan

LITTLE AMERICA
COFFEE SHOP

Water and gas lines, Wyoming Desert



Radiant heating system, Plainview, Texas

. . . and in thousands of other installations, too

SPANG®

QUALITY-CONTROLLED CW STEEL PIPE

GIVES TOP-QUALITY SERVICE

. . . because SPANG Pipe is

- **—made from top-quality steel**
- **—pre-heated, formed and welded under close control**
- **—descaled to provide a smooth finish**
- **—sized and straightened to give uniformity**
- **—rigidly tested and inspected to assure *top-quality***

A *top-quality* product like SPANG CW saves installation time—saves on construction costs, too. Let SPANG CW Steel Pipe help you make *top-quality* installations. Your local SPANG Distributor will be glad to serve you.

SPANG-CHALFANT

DIVISION OF THE NATIONAL SUPPLY COMPANY

General Sales Office: Two Gateway Center, Pittsburgh, Pa. District Sales Offices: Atlanta, Boston, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, St. Louis

SPANG CW STEEL PIPE

AAF®

ANSWERS YOUR

AIR FILTERS

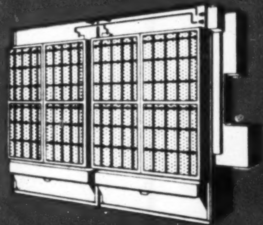
Complete Line Permits Coordinated Planning, Lower Over-all Costs!

FOR more than 30 years, American Air Filter and its Herman Nelson Division have concentrated on making AIR a better commodity for home, school and industry. The products pictured here are only a portion of the complete AAF-Herman Nelson line. Each was developed to meet a specific need; solve a definite problem.

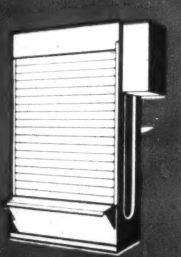
This concentration on "better air" has led to the development of the following:

- *a line of Air Filters utilizing ALL the principles of air filtration—electronic precipitation, dry filtration and viscous impingement.*
- *a complete line of Herman Nelson Heating and Ventilating products, from propeller fans to unit ventilators.*
- *the world's most complete line of Dust Control equipment, including dynamic precipitators, hydro-static precipitators, dry centrifugals and fabric arresters.*

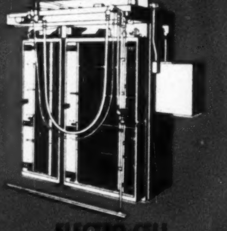
You draw on this vast "across-the-boards" experience when you select products of the American Air Filter Company. If it's an AIR problem, call your AAF representative. He's listed in your Classified Directory.



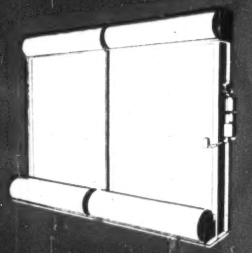
ELECTRO-MATIC
Electronic, Self-Cleaning Precipitator



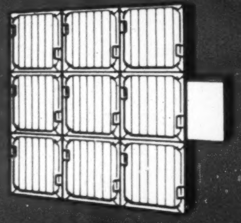
MULTI-DUTY
Self-Cleaning Air Filter



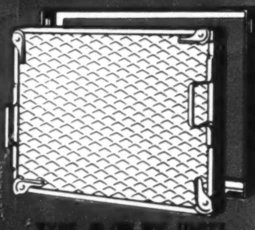
ELECTRO-CELL
Cell-Type Precipitator
With Type H Washer



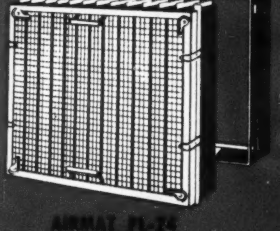
ROLL-O-MATIC
Automatic, Renewable Media
Air Filter



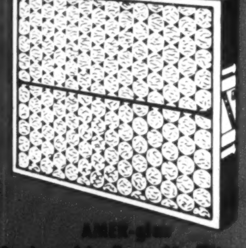
ELECTRO-PL
Dry-Type Electronic Filter



TYPE M/W-RV UNITS
Washable Unit Filters



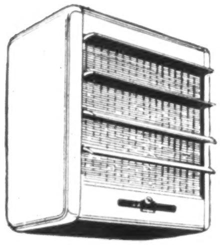
AIRMAT PL-24
Dry Filter



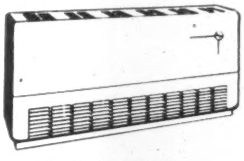
AMER-glas
Replaceable Type Air Filter

. . . pioneers in Air Care . cleaning, heating and moving air

AIR PROBLEMS!

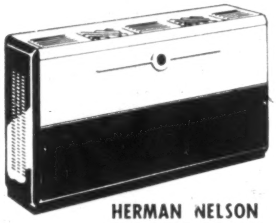


UNIT HEATERS
For Steam, Hot Water and Gas

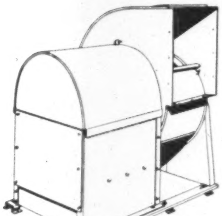


CONSOLE HEATERS

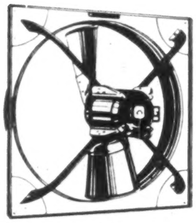
HEATING AND VENTILATING PRODUCTS



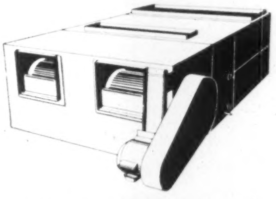
HERMAN NELSON
UNIT VENTILATORS



BELT & DIRECT DRIVE
UNIT BLOWERS

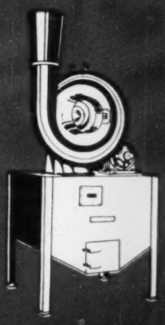


BELT & DIRECT DRIVE
PROPELLER FANS

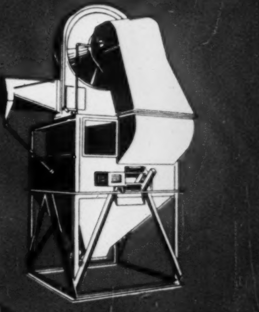


HEATING AND VENTILATING
UNITS

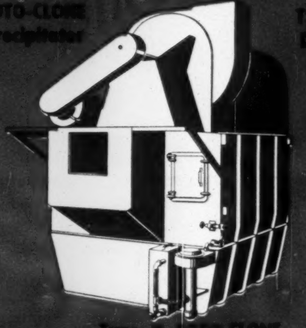
DUST CONTROL EQUIPMENT



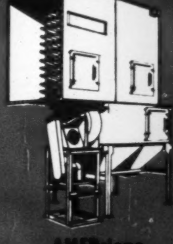
Type D ROTO-CLONE
Dynamic Precipitator



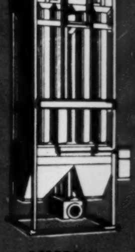
Type W ROTO-CLONE
Dynamic Precipitator



Type N ROTO-CLONE
Hydro-static Precipitator



AMERclone
Dry Centrifugal Collector



AMERjet
Fabric Dust Arrester

AAF

herman nelson

American Air Filter
COMPANY, INC.

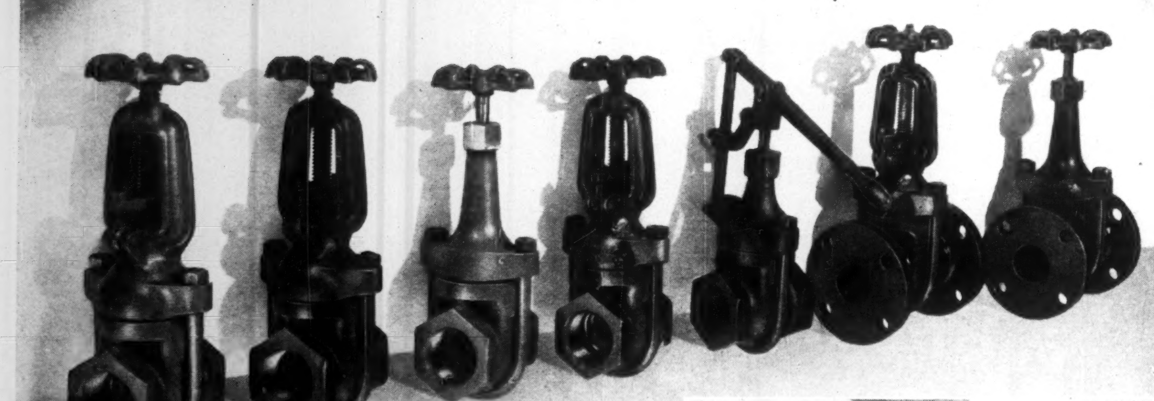
American Air Filter of Canada, Ltd., Montreal, P. Q. • 373 Central Avenue, Louisville 8, Kentucky

Eleven lines of WALWORTH Saddle Type Wedge Gate Valves

Bronze-Mounted — All-Iron — Ni-Resist

Outside Screw and Yoke — Non-Rising Stem — Quick Opening

Flanged Ends — Screwed Ends



Walworth saddle-type wedge gate valves are manufactured in eleven different combinations of designs and materials, seven of which are illustrated above.

Saddle type wedge gate valves are easy to take apart and are particularly suitable for lines requiring frequent cleaning. Walworth Saddle-Type Wedge Gate Valves are available in a variety of designs including OS & Y; Inside Screw Rising Stem, and Sliding Stem Quick Opening types—in Bronze-Mounted, All-Iron, and Ni-Resist. All types are designed to permit repacking under pressure in either the open or closed position.

FOR COMPLETE INFORMATION, See your local Walworth Distributor or write on business stationery for illustrated circular.

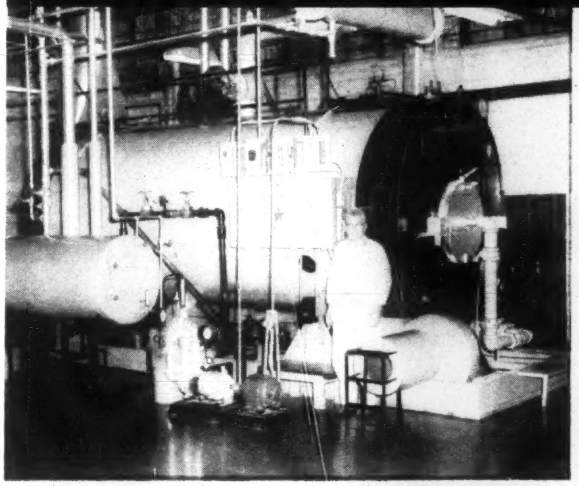
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

WALWORTH

60 East 42nd Street, New York 17, New York

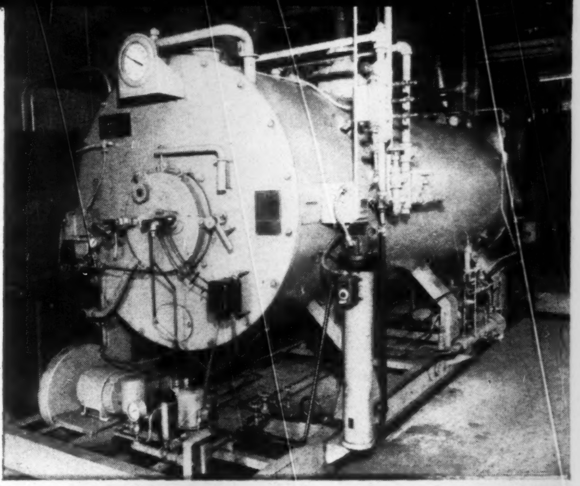
SUBSIDIARIES: ALLOY STEEL PRODUCTS CO. CONOFLOW CORPORATION GROVE VALVE & REGULATOR CO. SOUTHWEST FABRICATING & WELDING CO., INC. M & H VALVE & FITTINGS CO. WALWORTH COMPANY OF CANADA, LTD.

Some Typical Steam Problems Solved by AMESTEAM GENERATOR



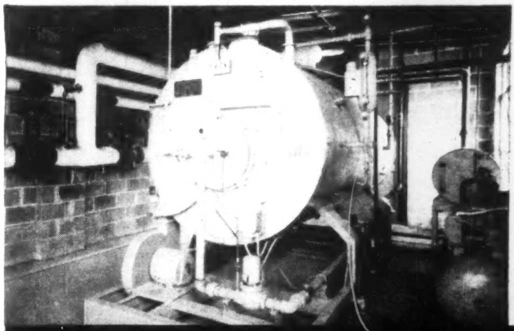
"...EXTREMELY VARIABLE STEAM DEMAND HANDLED SMOOTHLY AND EFFICIENTLY" at St. Joseph Paper Company, Houston, Texas. Writes C. J. Christman, Plant Engineer:

"We have an AMESTEAM GENERATOR, 300 HP, 150# W. P. in our plant. It has been in operation since January, 1949. We have an extremely variable steam demand, but this boiler handles it smoothly and efficiently. Practically all the original equipment is still in use and in first-class operating condition. We have never had a leak in our boiler or pipe installation during seven and one-half years of uninterrupted service. The boiler is economical, maintenance costs are very low, and we are completely satisfied."



"...BEST DOLLAR INVESTMENT WE HAVE MADE TO DATE," reports Scranton Wiping Cloth Company.

"...of all the equipment we purchased last year to completely equip our new laundry facilities, which include your 150 HP heavy oil, high pressure automatic AMESTEAM boiler," writes company official L. Light, "we can honestly state that the performance of this piece of equipment has been such that we now consider it the best dollar investment that we have made to date. From a fuel standpoint alone, our records indicate that it is costing us 51.7c per thousand pounds of steam..." (not counting the maintenance labor savings enjoyed by this firm!).



"VERY SATISFACTORY" on lumber dry kilns is the report by J. S. Gudmundsson, Director, Foreign Trade Division of Wood-Mosaic Corporation, describing performance of the AMESTEAM GENERATOR at the firm's New Orleans yard.

"The AMESTEAM GENERATOR we have there for running our lumber dry kilns has operated very satisfactorily, and we would specifically like to comment on the very excellent service that your representative has given us."

WHAT'S YOUR STEAM PROBLEM?

If you need 10 to 600 HP and want the kind of space-saving, trouble-free service enjoyed by these owners of AMESteam Generators, write today for our catalog and the name of your nearby Amesteam dealer.

AMES IRON WORKS INC.
BOX D-17
OSWEGO, N. Y.

LINE UP *with* SPORLAN *for* Right-Down-the-Line PEAK PERFORMANCE *on All Air Conditioning Installations*

No matter how large or small the system, there's a perfect Sporlan hook-up available from Catch-All to Distributor

Everyone knows about Sporlan Catch-Alls, the perfect Filter-Driers. They assure you filtering instead of straining. Dirt-free, sludge-free systems are the result. Harmful corrosive acids are adsorbed and retained. In addition, they dry down to an end point so low that any remaining moisture is absolutely harmless.

The new Sporlan Solenoid Valves offer even greater Peak Performance with the new power-packed Blue Seal Coil. No more worries over electrical failures. They're really tight closing, too!

Sporlan Thermostatic Expansion Valves with the exclusive Flow-Master element, are your guarantee against hunting. Alternately starved and flooded evaporators will never plague you again with these Peak Performers!

Uniform distribution to all circuits are yours with Sporlan Peak Performance Distributors. Their perfectly designed conical button and interchangeable nozzles give them greater flexibility and a much larger range of application.

So for Right-Down-The-Line Peak Performance on all air conditioning systems . . . Line up with Sporlan and get Peak Performance on every installation.

SPORLAN

**SPORLAN
VALVE COMPANY
7525 SUSSEX AVENUE St. Louis 17, Mo.**

EXPORT DEPT. AD AURIEMA INC., 89 BROAD STREET, NEW YORK 4, N. Y.

52,000 feet of wrought iron pipe provide built-in protection against corrosion for ice skating rink at new Kentucky Fair and Exposition Center, Louisville.

Ten miles of Wrought Iron Pipe checks corrosion at this ice skating rink

Testing of 3,500 welds in this wrought iron rink piping revealed only two leaks.

Carrying brine for ice skating rinks is one of the most corrosive services a piping material can encounter.

To check corrosive attack in this service at the Kentucky Fair and Exposition Center's Coliseum at Louisville, designers specified 52,000 feet of 1-inch wrought iron rink piping. This time-tested material was also installed in the Center's condensate returns, pump discharge and high pressure and medium pressure return lines.

Wrought iron's glasslike silicate fibers provide built-in resistance to corrosive agents. This exclusive protection—found only in wrought iron pipe—checks premature piping failure, abnormal maintenance and excessive repairs. No protective coatings are needed either.

Service records document wrought iron's qualifications for this service. Many of these case histories are covered in our Special Report, *Ice Skating Rinks—Their Construction and Maintenance.* Write for your copy today.

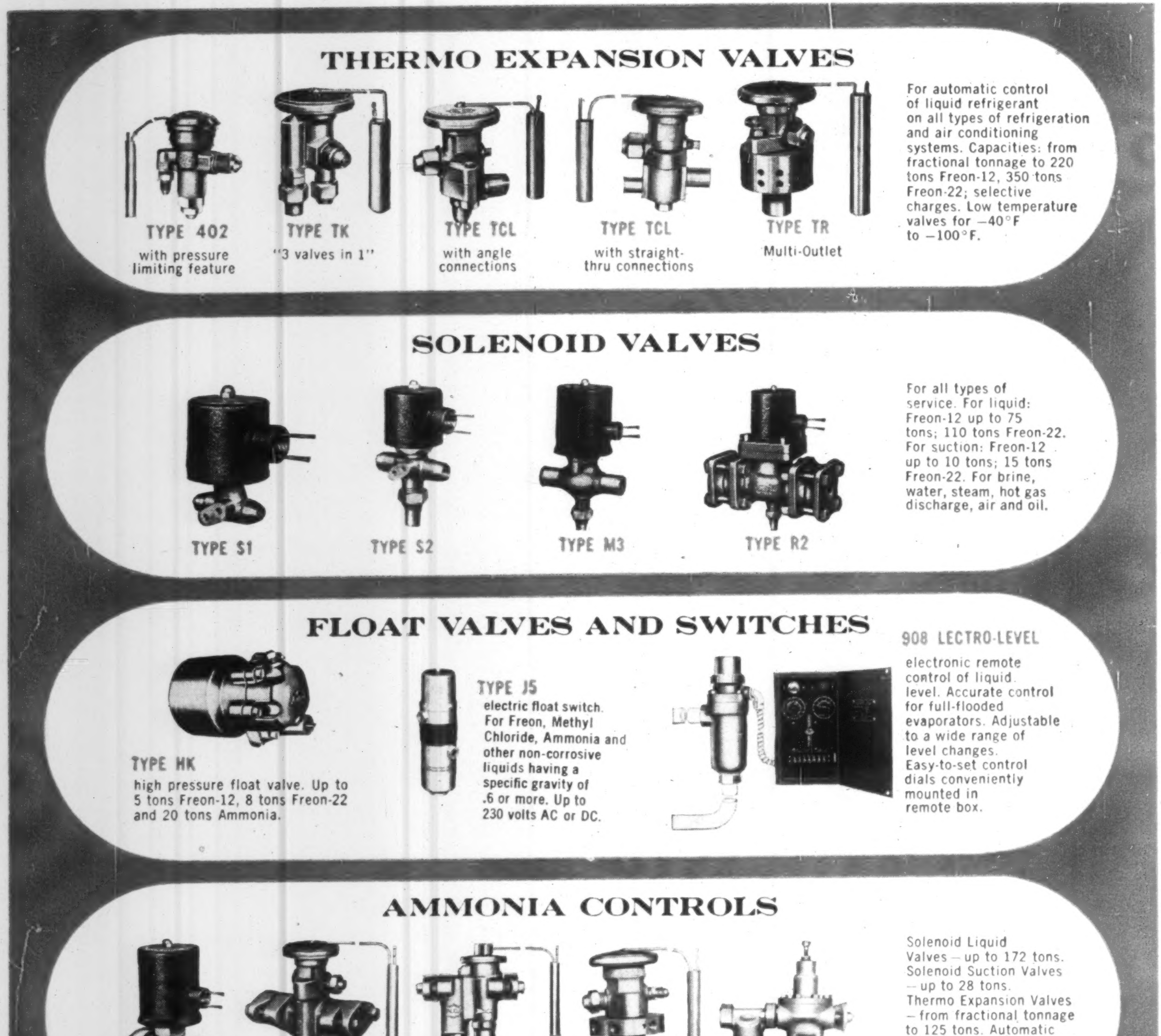
A. M. Byers Company, Pittsburgh, Pa. Established 1864. Division Offices in Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. International Division: New York, N.Y.

Available in Canada and throughout the world

Kentucky Fair and Exposition Center Ice Skating Rink
Architects: Fred Elswick and Associates, Louisville
Contractor: Ward Refrigeration and Engineering Company, Louisville
Mechanical Engineers: E. R. Ronald and Associates, Louisville

BYERS Wrought Iron Tubular and Hot Rolled Products

ALSO ELECTRIC FURNACE QUALITY STEEL PRODUCTS



THERMO EXPANSION VALVES

TYPE 402 with pressure limiting feature

TYPE TK "3 valves in 1"

TYPE TCL with angle connections

TYPE TCL with straight-thru connections

TYPE TR Multi-Outlet

For automatic control of liquid refrigerant on all types of refrigeration and air conditioning systems. Capacities: from fractional tonnage to 220 tons Freon-12, 350 tons Freon-22; selective charges. Low temperature valves for −40°F to −100°F.

SOLENOID VALVES

TYPE S1

TYPE S2

TYPE M3

TYPE R2

For all types of service. For liquid: Freon-12 up to 75 tons; 110 tons Freon-22. For suction: Freon-12 up to 10 tons; 15 tons Freon-22. For brine, water, steam, hot gas discharge, air and oil.

FLOAT VALVES AND SWITCHES

TYPE HK high pressure float valve. Up to 5 tons Freon-12, 8 tons Freon-22 and 20 tons Ammonia.

TYPE J5 electric float switch. For Freon, Methyl Chloride, Ammonia and other non-corrosive liquids having a specific gravity of .6 or more. Up to 230 volts AC or DC.

908 LECTRO-LEVEL electronic remote control of liquid level. Accurate control for full-flooded evaporators. Adjustable to a wide range of level changes. Easy-to-set control dials conveniently mounted in remote box.

AMMONIA CONTROLS

TYPE M91F

TYPE TG

TYPE UG

TYPE TX

TYPE E with strainer

Solenoid Liquid Valves – up to 172 tons. Solenoid Suction Valves – up to 28 tons. Thermo Expansion Valves – from fractional tonnage to 125 tons. Automatic Expansion Valves – from fractional tonnage to 60 tons.

SUCTION LINE CONTROLS

TYPE EPR EVAPORATOR PRESSURE REGULATORS

For all refrigerants, with connection sizes up to 6"

TYPES 771-772 SUCTION PRESSURE REGULATORS *(Hold-Back Valves)* Prevent motor overload. Freon-12, Freon-22.

TYPE 760 "EVAPOTROL" Pressure regulator – ½ ton, Freon-12 – ¾ ton, Methyl Chloride.

ALCO VALVES

the complete line of refrigerant controls

ALCO

For capacities in excess of those listed, write us and give specific requirements.

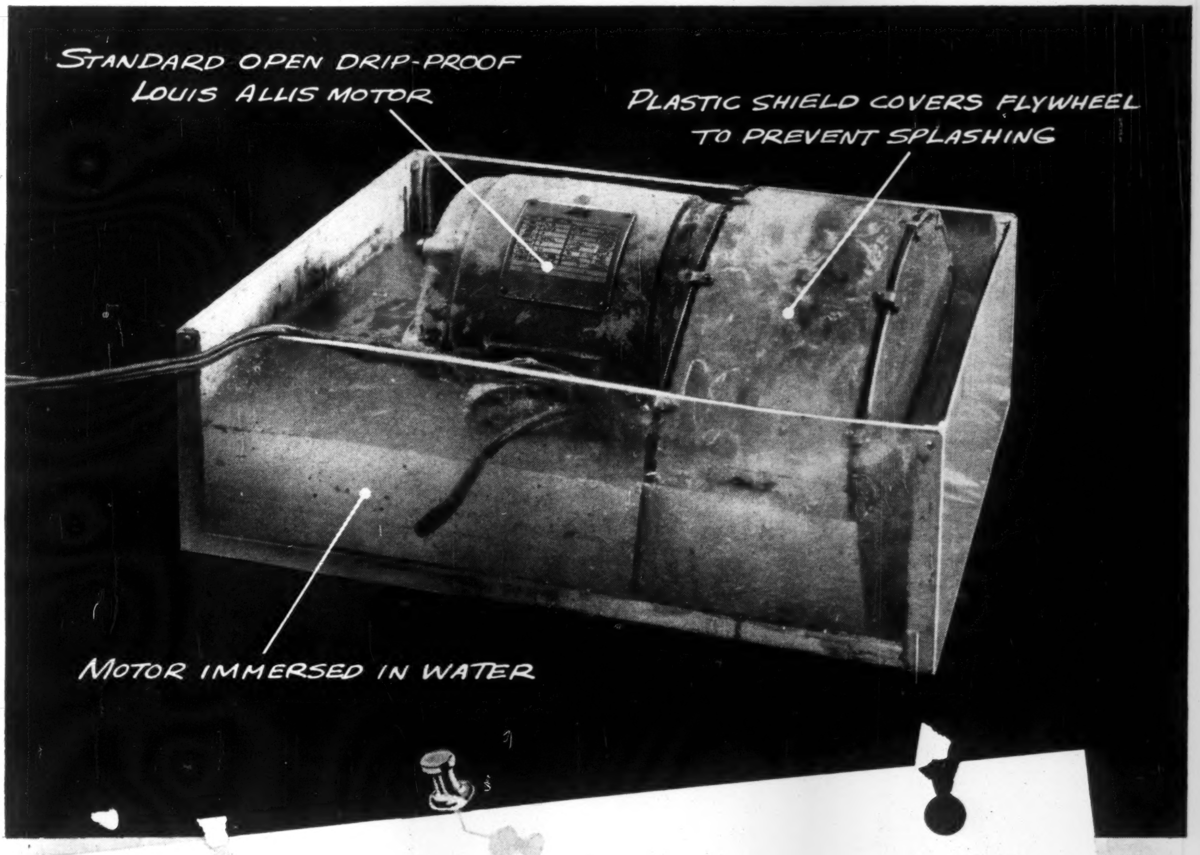
SEE YOUR ALCO WHOLESALER

ALCO ALSO OFFERS YOU

Constant Pressure (Automatic) Expansion Valves—Reversing Valves—Liquid and Suction Line Strainers.

ALCO VALVE CO.

861 KINGSLAND AVE. • ST. LOUIS 5, MO.


STANDARD OPEN DRIP-PROOF LOUIS ALLIS MOTOR
PLASTIC SHIELD COVERS FLYWHEEL TO PREVENT SPLASHING
MOTOR IMMERSED IN WATER

In water 1½ years...still running

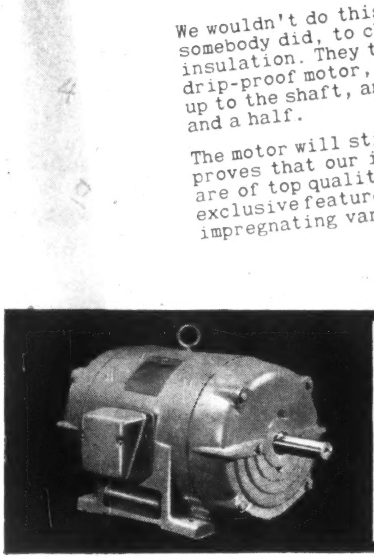
Dramatic proof that Louis Allis motor insulation provides unusual moisture resistance

We wouldn't do this to a motor. But somebody did, to check our new insulation. They took a standard open drip-proof motor, placed it in water up to the shaft, and ran it a year and a half.

The motor will still run, too, which proves that our insulating materials are of top quality. One of our exclusive features is the new phenolic impregnating varnish we use. As you can see, this varnish resists moisture, but it also has excellent thermal and chemical resistance and is not susceptible to embrittlement.

Insulation usually determines the life of a motor. That's why the insulating materials used in the new L. A. line are the product of years of continuous research and development. That's why Louis Allis motors run longer . . . give less trouble.

Find out the many other advantages available to you in the new L. A. line of motors. Write for our new bulletin No. 1700.



A complete line of standard rerated motors in frames 182 through 326U now in stock. Special rerated motors are available on short delivery.

LA-107

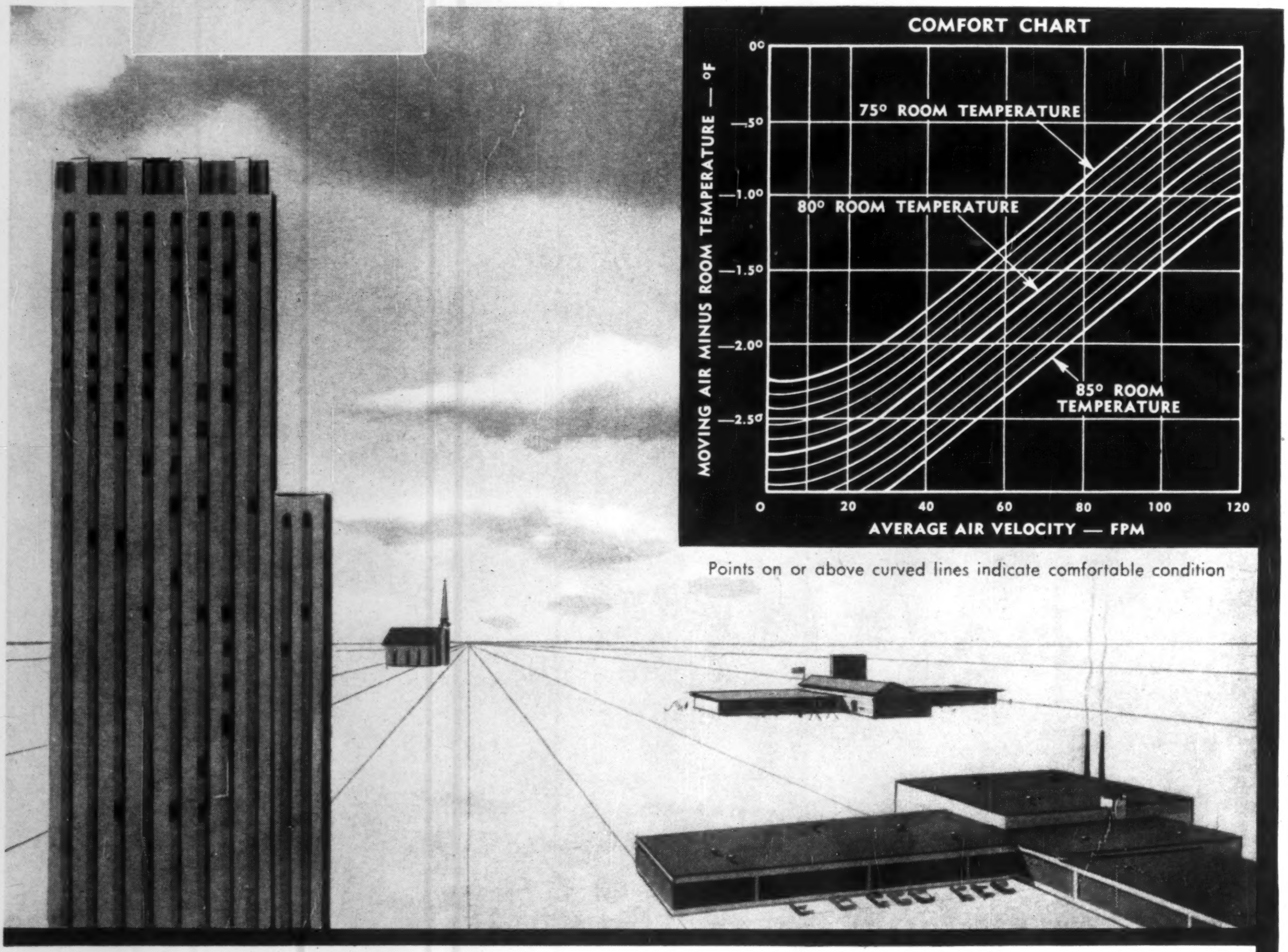
THE LOUIS ALLIS CO.
MILWAUKEE 7, WISCONSIN

THE MARK OF QUALITY

BARBER
COLMAN

Electrionic Automatic Controls....

for ideal "indoor



Points on or above curved lines indicate comfortable condition

Whatever your air conditioning needs, Barber-Colman guarantees results that meet requirements of above Comfort Chart

Creative team engineering at Barber-Colman Company effectively combines the modern advances of automatic temperature controls and engineered air distribution for performance-guaranteed results. Write for descriptive literature . . . or ask your architect or engineer about this exclusive "one responsibility" feature of Barber-Colman products and service.

COMBINED PRODUCTS, COMBINED SKILLS, UNDIVIDED RESPONSIBILITY...
COME TO ONE SOURCE...COME TO..............

……… PLUS Uni-Flo Air Distribution

weather" that's guaranteed!

Barber-Colman combined products assure proper relationship of velocities and temperatures for constant comfort . . .

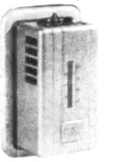
To the occupant of a building, what instantly marks the difference between a properly functioning air conditioning system and a poor one?

The correct system provides draft-free, quiet, *uniform distribution of the air . . . at a constantly held, comfortable temperature*, regardless of outside temperature changes.

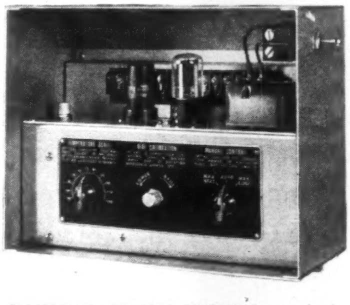
The incorrect system varies from "too warm" to "too cool," or "too drafty." Although it may be delivering exactly the same amount of conditioned air, it is not engineered to maintain proper relationship between *velocities* and *temperatures.*

Constant maintenance of this relationship is of extreme importance, because a person's feeling of warmth or coolness is affected by: (1) room temperature, (2) velocity of conditioned air being introduced to the room, and (3) temperature of moving air in relation to average air temperature in the room. To maintain the correct relationship of these variables and stay within the requirements shown in the Comfort Chart at left, there must be closely co-ordinated functioning of the system's *automatic controls and its air distribution units.*

Such performance is assured when you install Barber-Colman Electrionic Automatic Controls and Uni-Flo Engineered Air Distribution. For Barber-Colman has long years of *combined experience* in both automatic controls and air distribution — *and assumes one responsibility* to bring you ideal "indoor weather." Call your nearby Barber-Colman Field Office, or consult your architect or engineer.



THERMOSTATS
Room and remote bulb types.

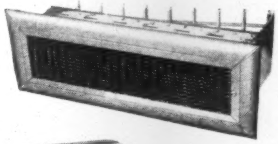


ELECTRONIC "CONTROL CENTER"—For completely automatic control from one central point.

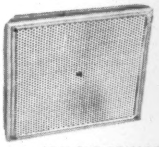
MOTOR-OPERATED VALVES—Wide range of sizes and types.

Electrionic Automatic Controls

Illustrated here are but a few of the modern automatic controls available from Barber-Colman. This company has a remarkable background in design, engineering, and precision production of fine equipment. Our field staff is widely experienced in solving all types of temperature control and air distribution problems.



UNI-FLO SIDEWALL DIFFUSERS—For quiet, draft-free air conditioning, heating, ventilating. Adjustable air patterns. Various frame styles.



UNI-FLO SQUARE AND RECTANGULAR CEILING DIFFUSERS

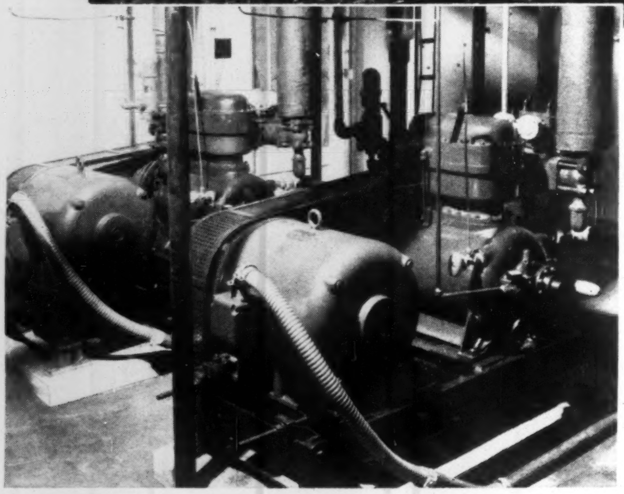
VENTURI-FLO CEILING DIFFUSERS
Uniform comfort, quiet. Air patterns adjust easily after installation.

Uni-Flo Engineered Air Distribution

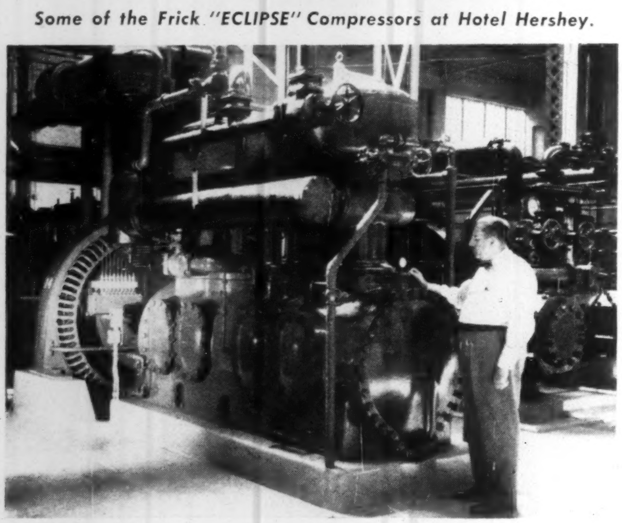
In addition to Uni-Flo units shown above, Barber-Colman Company produces a complete line of air distribution products for better air handling. Make this your source for reliable performance data and fine-quality equipment . . . take advantage of the continuous flow of new developments from the renowned Barber-Colman Laboratory.

……… BARBER-COLMAN COMPANY

Dept. M, 1679 Rock Street, Rockford, Illinois



Some of the Frick "ECLIPSE" Compressors at Hotel Hershey.



12 by 12 Four-cylinder Heavy-duty Ammonia Compressor in Continuous Service at the Hershey Factory Since 1951.

TRADE FRICK MARK®

Air Conditioning

Serves the Famous Hotel Hershey

Here Frick "ECLIPSE" compressors cool the dining and ball rooms, and most of the guest rooms. Frick Refrigeration also serves the Hershey ice arena and the cold storage; furthermore, a heavy-duty Frick compressor is at work in the great Hershey Chocolate plant.

Whether you or your clients need any of these cooling services, in any commercial or industrial size, there's a Frick system to meet your requirements with the utmost dependability. Let us submit estimates now.

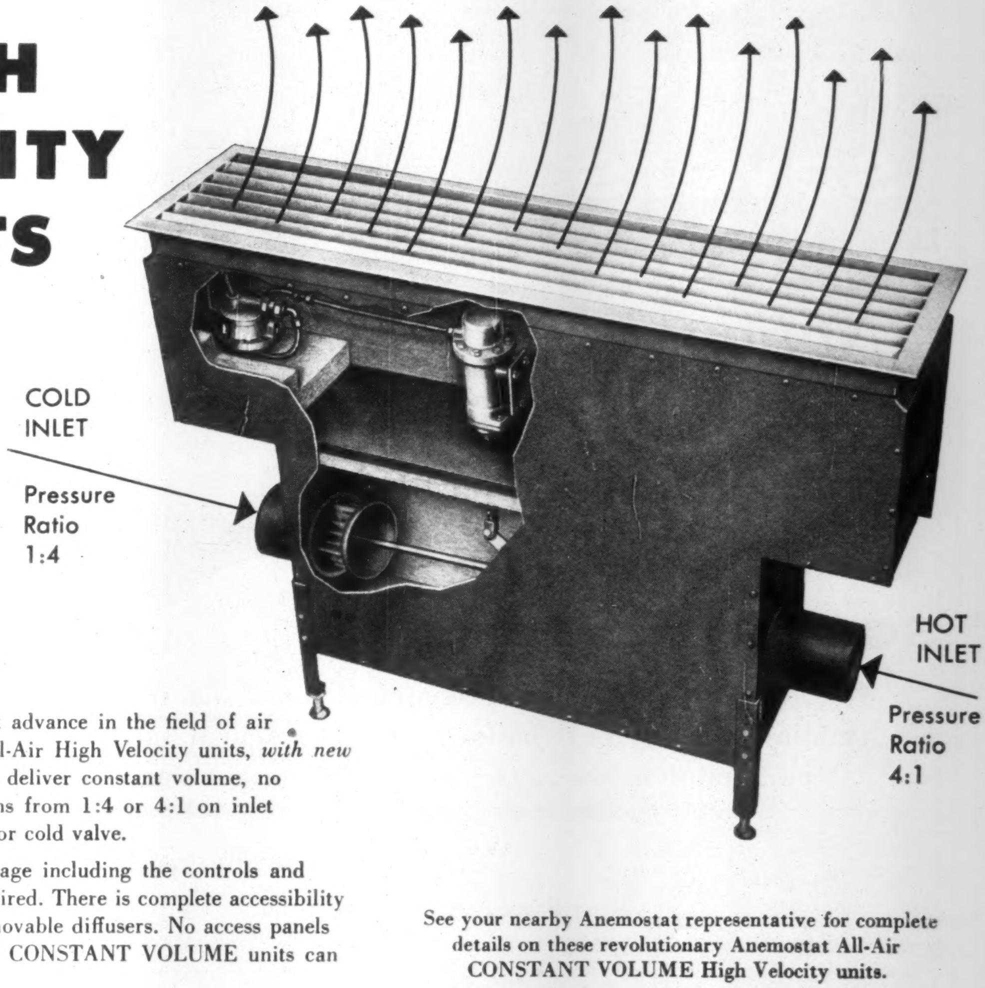
DEPENDABLE REFRIGERATION SINCE 1882
FRICK Co.
WAYNESBORO, PENNA. U.S.A.

ANEMOSTAT *Announces . . . .*

ALL-AIR

CONSTANT VOLUME

HIGH VELOCITY UNITS



Here is a vitally important advance in the field of air distribution. Anemostat All-Air High Velocity units, *with new simple automatic controls,* deliver constant volume, no matter what the fluctuations from 1:4 or 4:1 on inlet pressures of either the hot or cold valve.

Each unit is a single package including the controls and integral thermostats if required. There is complete accessibility of all controls through removable diffusers. No access panels are required. Capacities of CONSTANT VOLUME units can be pre-set at the factory.

These Anemostat CONSTANT VOLUME units

- Assure scientific draft-free distribution of air.
- Are available in 100% induction units.
- Include Anemostat die-cast metal rocket-socket valves. More than 50,000 of these valves are in service, and not a single one has needed maintenance.
- Operate on standard 15 lb positive acting compressed air systems.

See your nearby Anemostat representative for complete details on these revolutionary Anemostat All-Air CONSTANT VOLUME High Velocity units.

Anemostat: The Pioneer of All-Air High Velocity Systems

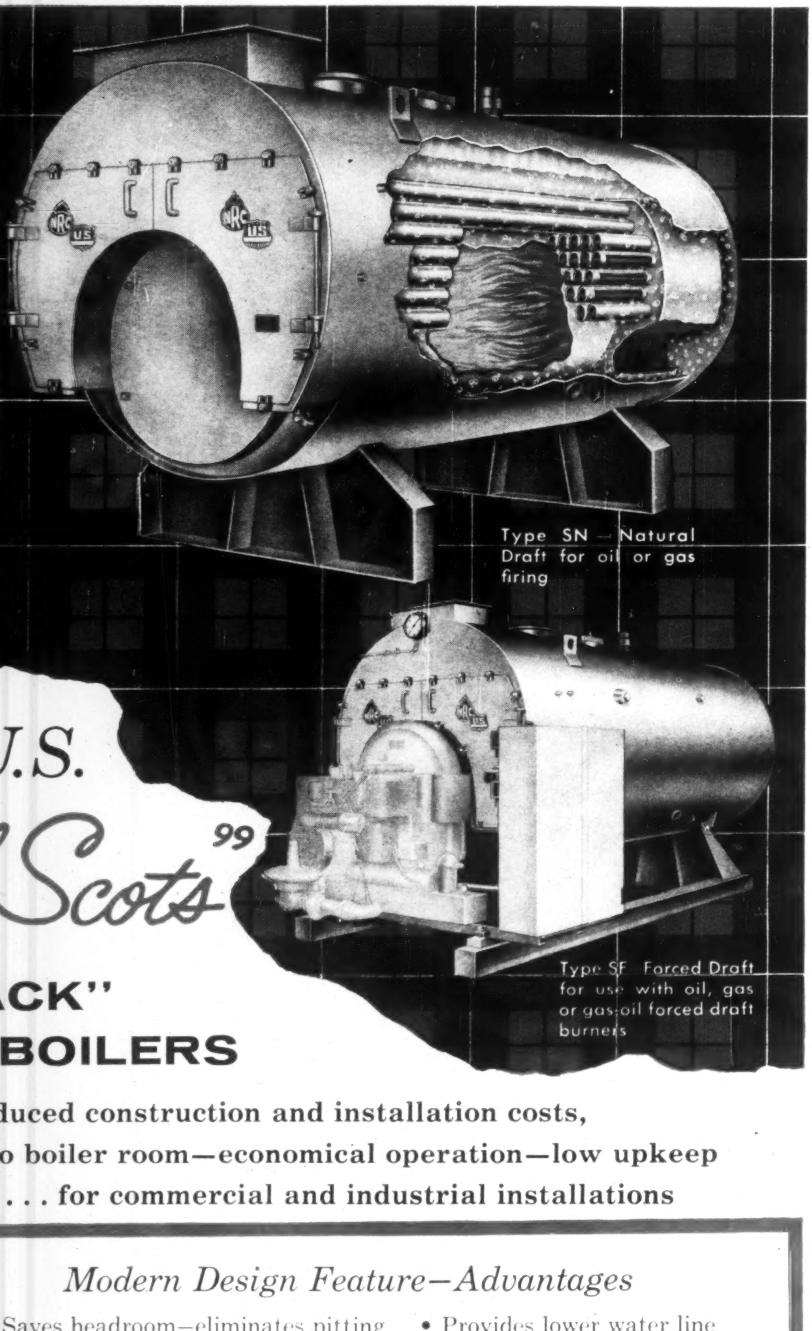
ANEMOSTAT®

DRAFTLESS *Aspirating* **AIR DIFFUSERS**

ANEMOSTAT CORPORATION OF AMERICA
10 EAST 39TH STREET, NEW YORK 16, N. Y.
Representatives in Principal Cities

AC 1344

natural
money
savers



Type SN — Natural Draft for oil or gas firing

Type SF Forced Draft for use with oil, gas or gas-oil forced draft burners

National-U.S.
"Queen of Scots"
"WET-BACK"
SCOTCH type BOILERS

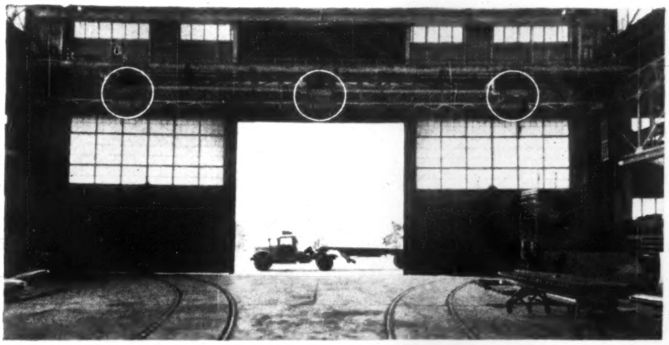
provide reduced construction and installation costs, minimum heat loss to boiler room—economical operation—low upkeep and maintenance . . . for commercial and industrial installations

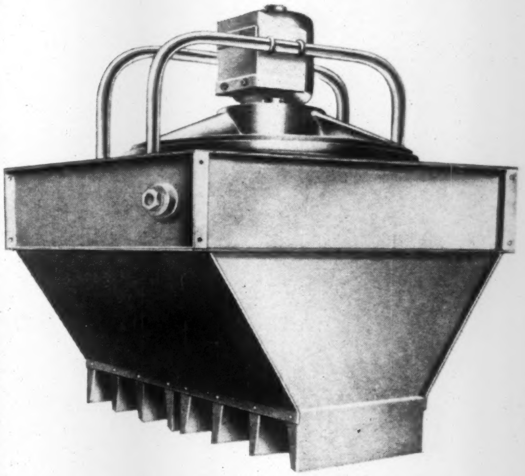
Modern Design Feature—Advantages

- Saves headroom—eliminates pitting
- Provides lower water line
- No special foundation necessary
- "Wet-Back" combustion chamber
- ASME constructed

Write for Catalogs 819 and 820

National-U.S. Radiator
CORPORATION
HEATING AND AIR CONDITIONING DIVISION
Johnstown, Pennsylvania



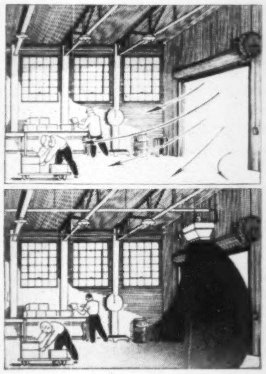


open doors

in cold weather can cause labor unrest

...eliminate cold blasts with

WING DOOR HEATERS



When large outside doors are opened in winter time

1—Cold drafts rush in.
2—Workers are chilled.
3—Health is endangered.
4—Production slows down.
5—Heating system is strained.

Avoid these ill effects by installing Wing High Velocity Door Heaters.

As soon as doors are opened a curtain of hot air covers the open doorway. Workers inside then feel only a comfortable, warm gentle air movement. Wing Door Heaters use little steam as they operate only when doors are open. Actuation is by thermostat or a door switch or both. Write for Bulletin DH-2A.

Wing
High Velocity
DOOR HEATERS

L. J. Wing Mfg. Co. 140 Vreeland Mills Rd., Linden, N. J.
Factories: Linden, N.J. and Montreal, Canada
In Europe: WANSON, Haren-Nord, Brussels, Belgium

L. J. Wing Mfg. Co.	HP-1

140 Vreeland Mills Rd., Linden, N.J.

Please send me Bulletin DH-2A—Door Heaters

Name..

Firm..

Address..

City.................... Zone..... State.........

WING REVOLVING HEATERS

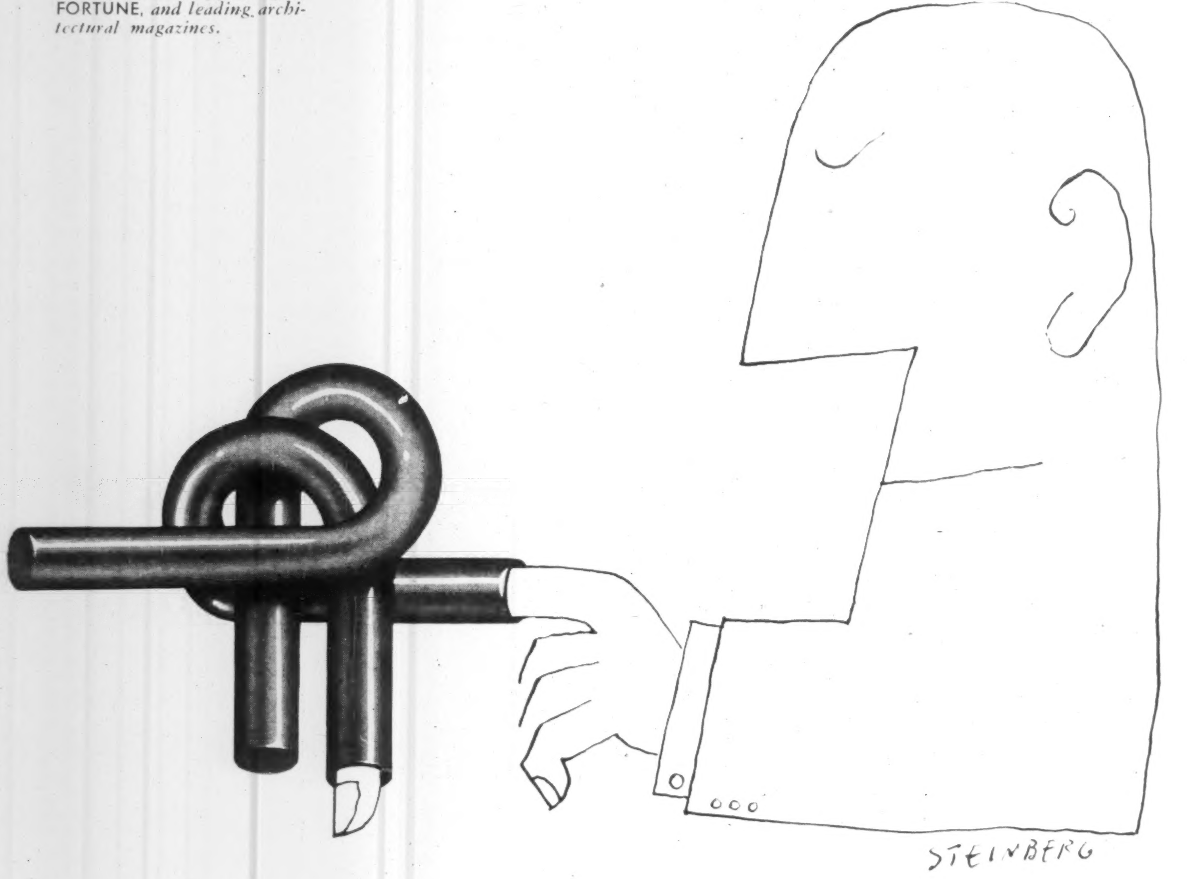
WING FRESH AIR SUPPLY HEATERS

WING DRAFT INDUCERS

WING TURBINES

Mail this coupon for bulletin

One of a series appearing in FORTUNE, *and leading architectural magazines.*



puzzlement

What happened to the hole in Lewin-Mathes Tube?

It's been eliminated in *part* of our production . . . so that users of Brass Rod can now enjoy the same standard of quality and service which has been responsible for the popularity of Lewin-Mathes Copper and Brass Tube and Pipe during the past 25 years.

In designing America's most modern Brass Rod mill, Lewin-Mathes has pioneered new automatic production and testing methods . . . adding even greater efficiency to our already *completely integrated* plant.

Now more than ever, specifying uniformly perfect Tube, Pipe and Rod is no puzzlement. Simply remember Lewin-Mathes—the *integrated specialist!*

LEWIN MATHES
SAINT LOUIS, MISSOURI
MANUFACTURERS OF
COPPER AND BRASS TUBE PIPE AND ROD

NEW!

tt® TUBE-TURN® 6" 125 WOG A181-1
TAPER FACE

New lightweight
TUBE-TURN
Welding neck flange
125 lb. W.O.G.

TUBE-TURN* "TAPER FACE" FLANGE

...cuts cost of light-duty piping

...protects low pressure pumps and valves

Tube Turns announces a new lightweight welding neck flange for service up to 125 lbs. W.O.G. pressure, offering two important cost-cutting advantages: (1) It is priced lower than conventional flanges. (2) This lightweight welding neck flange has a tapered face which affords an effective seal with reduced bolt loading; hence, permits use of steel butt welding neck flanges without danger of cracking the flat faced cast iron flanges of valves and pumps used in low pressure piping systems. Here is another result of Tube Turns pioneering research, and an example of how you get *more for your money* when you specify TUBE-TURN Welding Fittings and Flanges and buy them from your nearby Tube Turns' Distributor.

tt
TUBE-TURN
TRADE MARKS

*"TUBE-TURN" and "tt"
Reg. U. S. Pat. Off.

The Leading Manufacturer of Welding Fittings and Flanges

TUBE TURNS LOUISVILLE 1, KENTUCKY

A Division of National Cylinder Gas Company

DISTRICT OFFICES: New York • Philadelphia • Pittsburgh • Cleveland • Detroit • Chicago • Kansas City • Denver
Los Angeles • San Francisco • Seattle • Atlanta • Tulsa • Houston • Dallas • Midland, Texas

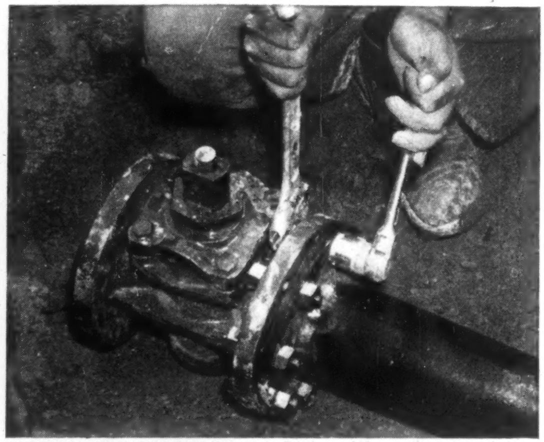
HOW TO SAVE

How you cut costs with

TUBE-TURN FLANGES

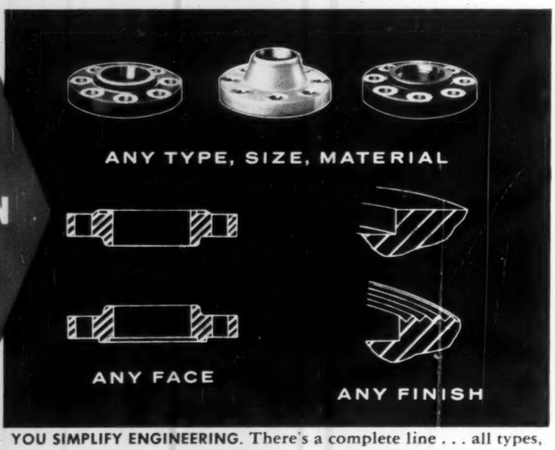
with the
NEW
Taper Face
Flanges

CUTS FLANGE COSTS. For many applications of light-duty piping . . . up to 125 lb. W.O.G. pressure . . . the new TUBE-TURN Taper Face Flange gives rated performance at a lower price than conventional designs. Here's a good teammate for lightweight pipe and fittings in applications such as water, oil and gas distribution ...on pumps and compressors...any installation where welded piping must be flanged to low pressure valves, pumps or equipment.



PROTECTS VALVES AND PUMPS. Lightweight and tapered face permit good seals with reduced bolt-loading on valve or pump flanges. Lighter, lower-priced valves can be used without danger of cracking their flat faced cast iron flanges. Also, lighter neck of flange speeds up welding to pipe.

with all
TUBE-TURN
Flanges



YOU SIMPLIFY ENGINEERING. There's a complete line . . . all types, sizes, capacities, materials. You can specify TUBE-TURN Flanges and know you'll get the exact answer to your problem. Also, Tube Turns offers you engineering help.

YOU STREAMLINE PURCHASING. Your nearby Tube Turns' Distributor provides complete-line service. This one source for all your needs in welding fittings and flanges enables you to put *all* your requirements on *one* order . . . to cut red tape, save valuable time.

MAIL FOR BOOKLET The New line of Taper Face Flanges is described in this Tube Turns booklet . . . free on request.

TUBE TURNS, Dept. A-1
224 East Broadway, Louisville 1, Kentucky

Please send free Bulletin on Taper Face Flanges.

Company Name ____________________

Company Address ____________________

Your Name ____________________

Position ____________________

City __________ *Zone* __________ *State* __________

tt
TUBE-TURN
Taper Face
Flanges

Available from your nearby TUBE TURNS' distributor

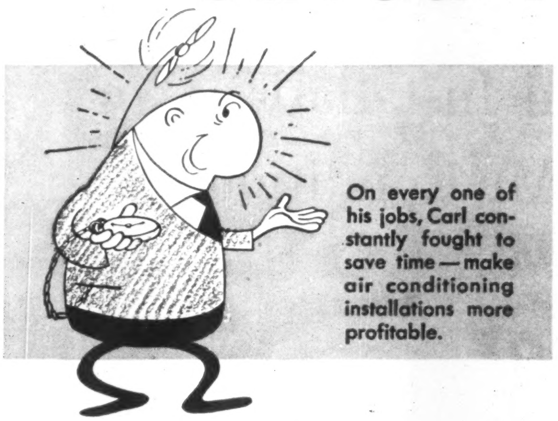
*"TUBE-TURN" and "tt" Reg. U. S. Pat. Off.

TUBE TURNS
LOUISVILLE 1, KENTUCKY
A DIVISION OF NATIONAL CYLINDER GAS COMPANY

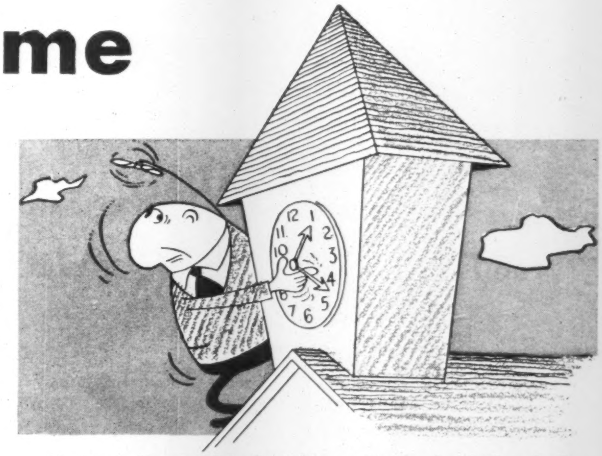
New York · Philadelphia · Pittsburgh · Cleveland · Detroit
Chicago · Kansas City · Denver · Los Angeles · San Francisco
Seattle · Atlanta · Tulsa · Houston · Dallas · Midland, Texas

HOW *Cool Carl* the Competent Contractor

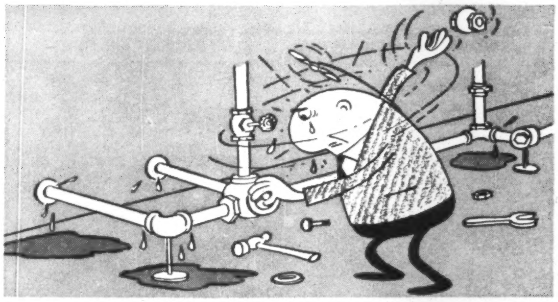
Saved Time



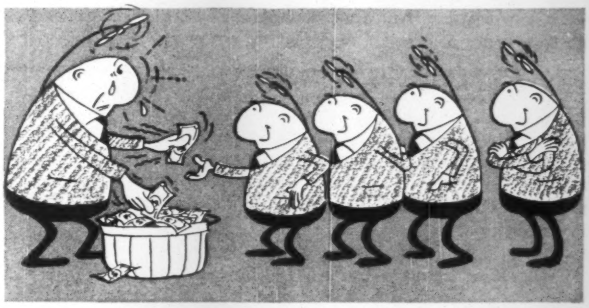
On every one of his jobs, Carl constantly fought to save time — make air conditioning installations more profitable.



He knew he couldn't do it by . . . Setting back the clock



He knew he couldn't do it by . . . Impractical shortcuts



He knew he couldn't do it by . . . Adding more help

Then he found the best possible solution . . . he specified

Allis-Chalmers Air Conditioning PUMPS

Cool Carl really saved time when he and the consulting engineer specified Allis-Chalmers!

1. He saved engineering time — the Allis-Chalmers pump representative knew his stuff, helped select just the *right* pumps.

2. He saved installation time — to install the compact A-C unit, all Carl did was bolt down the base . . . then connect power, piping and ground.

3. He saved service time — the many extra-quality features of A-C pumps slashed Carl's call-backs.

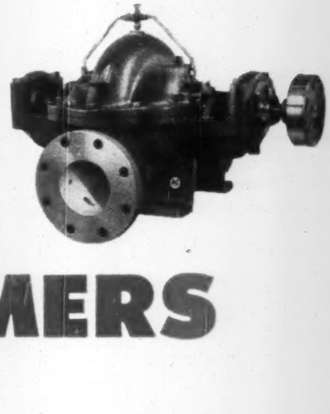
You'll save time too by specifying A-C pumps. Contact your nearby Allis-Chalmers representative or distributor, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

Fractional and Integral Horsepower

pump line has capacities to 2500 gpm, heads to 400 feet.

Other Types of Pumps

by Allis-Chalmers can provide heads up to 550 feet and capacities to 2500 gpm. Various models available cover 99% of all air conditioning applications.



Electrifugal is an Allis-Chalmers trademark.

A-C ALLIS CHALMERS

ALLIS-CHALMERS

A-5227

"Packaged"

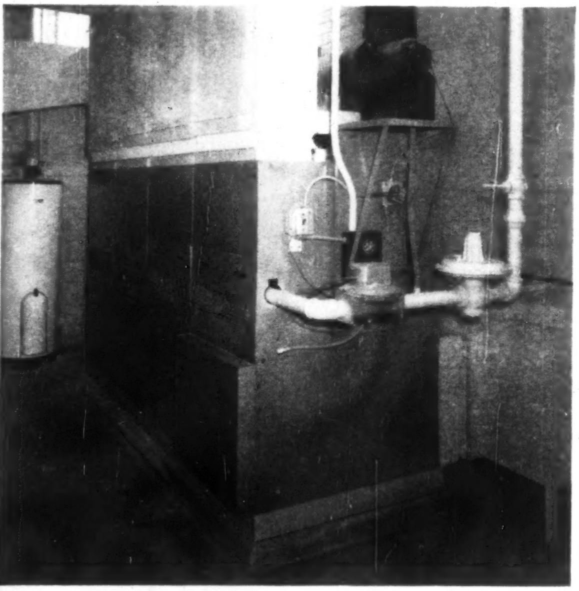
Janitrol Heavy Duty Heaters Simplify System Planning And Installation For Central Heating And Air Conditioning

YOU can combine up to seven of these powerful heavy duty blower heater sections on a single, rigid steel base frame—provide up to 1,750,000 Btu/hr. input capacity (250,000 Btu. per section). You select from a wide range of standard blowers and motors to insure the right combination for correct air delivery and temperature rise in each application. And installation is speedy, because complete factory assembly and testing saves time on the job.

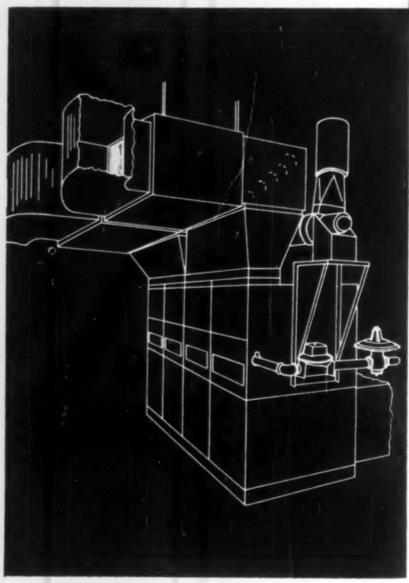
SUMMER AIR CONDITIONING EASILY ADDED

Evaporator cooling coils are easily mounted in the outlet plenum, when summer cooling is desired. Powerful 15″ centrifugal blowers, cushioned in rubber, deliver ample air to overcome resistance of evaporator coils and duct system. A single motor drives blower fans in multi-section installations.

All Janitrol Heavy Duty Heaters are protected from burn-out, corrosion and cracking by the famous Janitrol Multi-Thermex heat exchanger with fire-fused protective coating. Dual-fuel manifold and controls to operate on natural or LP gas are optional.



Warm air from this 1,000,000 Btu (4-unit) central heating plant is distributed through the duct system to heat a modern elementary school. While strength and sturdiness are maintained in their construction, Janitrol heavy duty heaters are not too heavy for installation on overhead platforms, when it is desirable to save floor space.

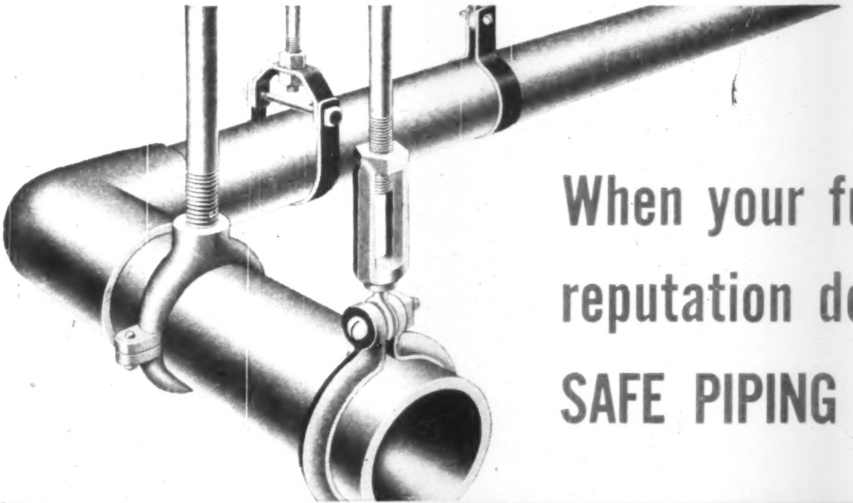


This schematic drawing shows how cooling coils can be easily added in the outlet plenum to supply summer air conditioning.

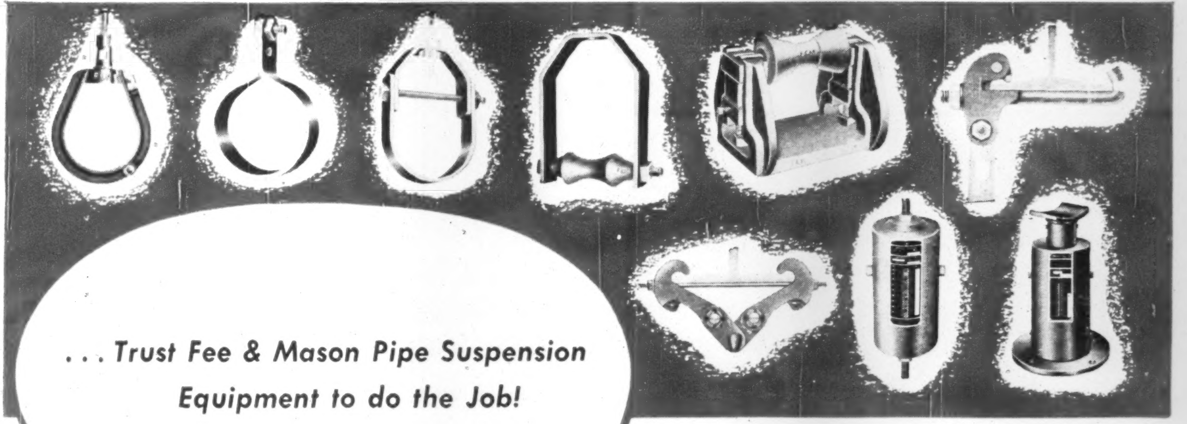
. . . for complete specifications and data on Janitrol heavy duty blower heaters, write for bulletin JS-247.

®**Janitrol**
HEATING AND AIR-CONDITIONING
DIVISION
SURFACE COMBUSTION CORPORATION
COLUMBUS 16, OHIO
In Canada: Moffat Heating and Air Conditioning Div.
of Moffats Ltd., Toronto 15.

ALSO MAKERS OF *Surface* INDUSTRIAL FURNACES AND *Kathabar* HUMIDITY CONDITIONING



When your future reputation depends on SAFE PIPING SUPPORT...



. . . Trust Fee & Mason Pipe Suspension Equipment to do the Job!

Specification and installation don't end the job . . . it's the years of safe, trouble-free support in pipe suspension systems that really count.

Fee & Mason's wide selection assures your using the right pipe hanger or support to do your job. And Fee & Mason's "life-of-building" engineering guarantees the longer-life and adequate pipe support that keeps your customers happy!

FEE & MASON

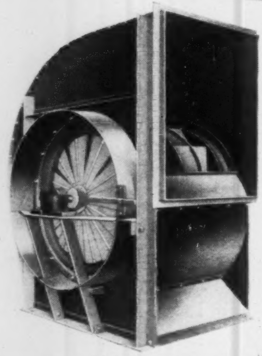
AMERICA'S LEADING SPECIALISTS IN PIPE HANGERS AND SUPPORTS

Since 1893

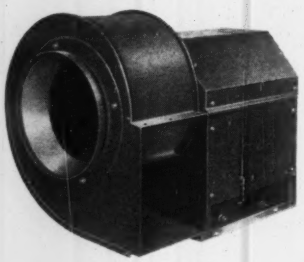
FEE & MASON MFG. CO., INC. • MANASQUAN, NEW JERSEY

THERE'S A F&M STOCKING WHOLESALER IN YOUR TOWN!

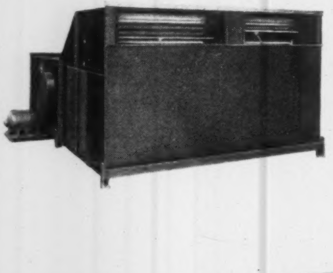
CLARAGE...



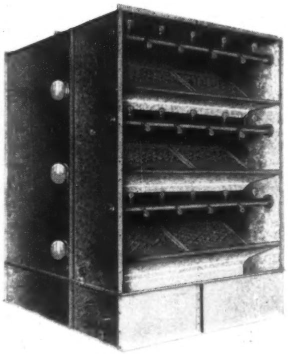
Ventilating and Air Conditioning Fans Type NH Fans (shown) with backwardly inclined blade wheels, capacities 1,000 to 725,000 cfm. Catalog 221. Type HV Fans with forward curved multiblade wheels, capacities 150 to 450,000 cfm. Bulletin 200.



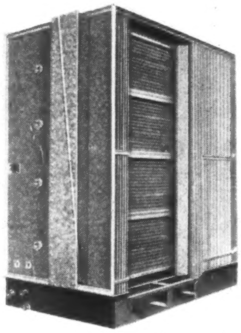
Ready Unit Ventilating Sets Complete, ready-to-run units for smaller air handling requirements. Catalog 515. Direct connected and V-belt models in 18 sizes, capacities 100 to 14,000 cfm. Bulletin 500.



Air Conditioning Units Blow-Thru Multitherms (shown) for zone control. Bulletin 1310. Draw-Thru Multitherms for comfort and process applications. Catalog 1307. Hi-Static (Bulletin 1312) and Sprayed Coil Multitherms also available. Capillary Conditioners for exceptional air cleaning. Catalog 1351.



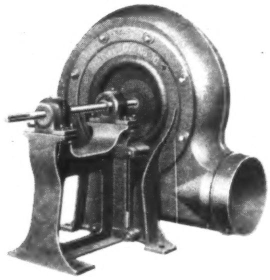
Air Washers Capillary (shown) and Spray Type Air Washers for air cleaning and purification. Catalog 405 for Capillary type; Catalog 400 for Spray type.



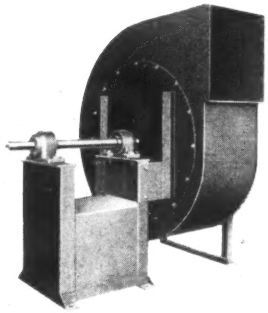
Sprayed Coil Units Unicoil Units designed principally for cooling and dehumidifying service in central station air conditioning systems. Catalog 411.

CLARAGE FAN COMPANY

dependable equipment for making air your servant



Industrial Exhausters and Blowers Type CI Exhausters (shown) with capacities 200 to 3,800 cfm, pressures to 22". Catalog 705. Type O Blowers with capacities 150 to 45,000 cfm for higher pressures. Bulletin 850.

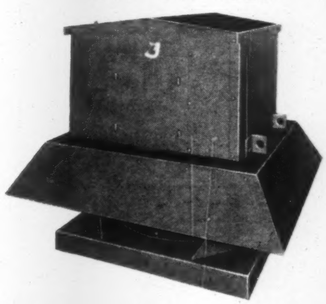


Industrial Air and Material Handling Fans Type XL Fans range up to 130,000 cfm, 18" SP, 60" inlet diameter. Four wheel types, 16 fan sizes—smaller sizes adjustable as to discharge. Bulletin 702.

NEW

See it at the Show

Booth 817 - 821



Introducing . . . the new Clarage Centrilator, a centrifugal type Power Roof Ventilator, with an exclusive Clarage Jet Siphon feature for quiet performance, high efficiency. Self-contained, exceptionally rugged, low silhouette, economical in all respects. Ten standard sizes with capacities to 26,400 cfm. Request Bulletin 550.

The Clarage line also includes Unitherm Unit Heaters with multiblade fans . . . Clarco Unit Heaters with propeller fans . . . Unit Stoker Fans in a wide size range . . . Propeller Fans with capacities 700 to 36,000 cfm . . . Vortex Control for efficient, economical air volume regulation . . . Mechanical Draft Fans. By specializing — building air handling and conditioning equipment *exclusively* — Clarage has a concentrated "know-how" that means important dividends for you.

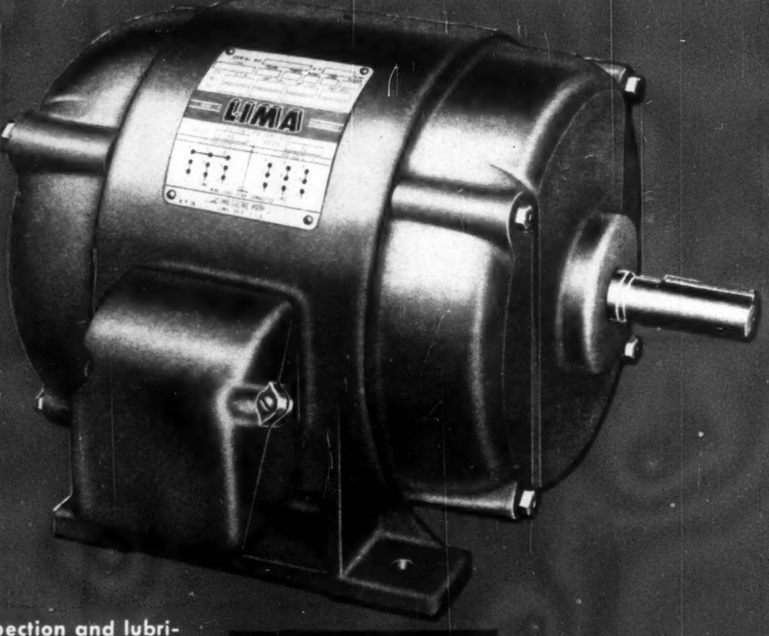
KALAMAZOO, MICHIGAN

A New Approach to Perfection

MAINTENANCE-FREE

LIMA MOTORS

IN ALL NEW NEMA FRAME SIZES



- 30% LESS WEIGHT PER HORSEPOWER
- 30% VOLUMETRIC SIZE REDUCTION
- DUAL FANS INTEGRALLY CAST WITH ROTOR
- COMPLETE ROTOR ASSEMBLIES DYNAMICALLY BALANCED
- RIGID, CAST IRON FRAMES WITH INTEGRALLY CAST FEET
- DIAGONALLY SPLIT CAST ALUMINUM CONNECTION BOXES—CADMIUM PLATED COVER SCREWS
- TOTALLY ENCLOSED FRAMES MEET J.I.C. SPECIFICATIONS

Slash maintenance costs and eliminate costly inspection and lubrication programs with Lima Motors in NEW NEMA frame sizes. With lubricated-for-life DOUBLE-WIDTH ball bearings, solid die cast aluminum rotors with dual integral fans, and Mylar insulation . . . Lima gives you higher full-load speeds with the most complete motor protection available. Install these new Finest Quality Lima Motors—and forget them.

Lima now has in production all ratings in new NEMA frame sizes 182 through 326U. Get complete details on Lima's new NEMA *maintenance-free* motors from your Lima Representative now! If he is not already calling on you, his name and address will be found in *Thomas' Register, MacRae's Blue Book* or *Conover-Mast Purchasing Directory*.

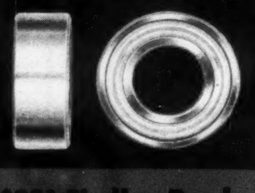
Of course, Lima will continue to produce regular NEMA frame sizes 66 to 505 (⅓ to 150 H.P.), incorporating the latest advances in motor design.

SINGLE-WIDTH UNPROTECTED

THE OLD WAY

Open and unprotected motor bearings subject to contamination and must be inspected and lubricated frequently.

DOUBLE-WIDTH
FULLY PROTECTED



THE LIMA WAY

Sealed and protected—Lima's DOUBLE-WIDTH pre-lubricated motor bearings require no attention—just put the motor to work and forget it.

THE LIMA ELECTRIC MOTOR COMPANY, 4991 Findlay Road Lima, Ohio

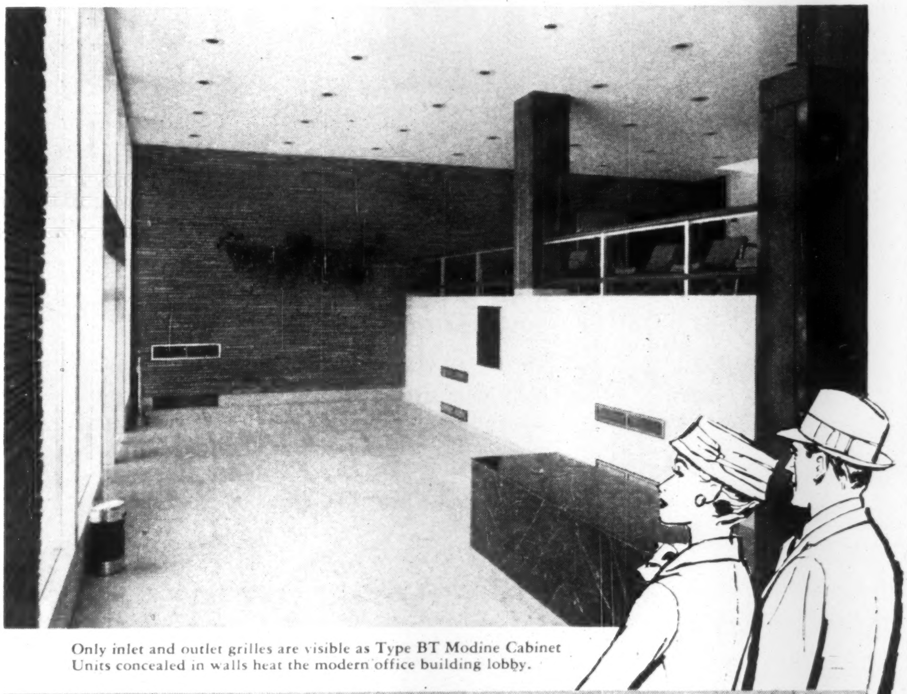
Representation throughout the U. S., Canada and abroad

ELECTRIC LIMA MOTORS

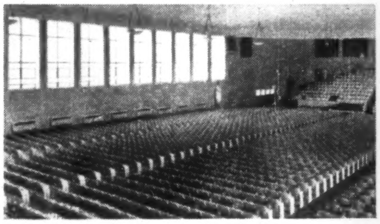
FIRST . . . FOR MOTORS . . . DRIVES . . . SPEED REDUCERS

If your new building or remodeling calls for

low-cost heat • beauty • versatility



Only inlet and outlet grilles are visible as Type BT Modine Cabinet Units concealed in walls heat the modern office building lobby.



68 Modine cabinet units heat this church.

Cabinet units on ceiling save wall space.

... make *Modine* Cabinet Units your choice

With Modine Cabinet Units it's easy to select the right capacity, style, performance for any hot water or steam heating requirement. You have a choice of 20 variations for upright or inverted installation . . . fully exposed, recessed or concealed . . . on floor, wall or ceiling. And sizes range from 120 to 640 Edr.

Some units heat with hot water . . . cool with chilled water. All models can be installed with or without ducts. Using inexpensive accessories, Modine Cabinet Units ventilate with outside air. What's more, they cost less to install than individual unit ventilators or air conditioners.

Smartly styled Modine Cabinet Units provide unmatched heating and installation flexibility . . . for commercial, institutional, public buildings. See the Modine representative listed in your classified phone book, or write to Modine Mfg. Co., 1509 DeKoven Ave., Racine, Wis., for Bulletin 552.

C-1316

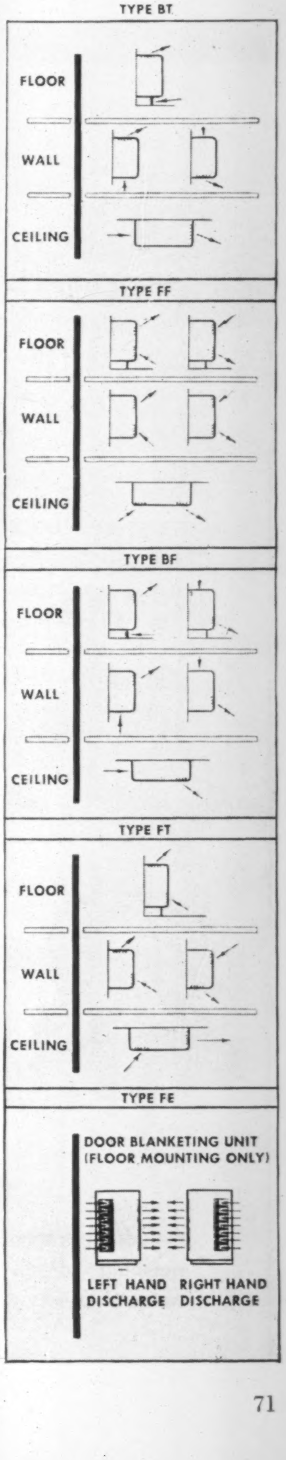
Modine

CABINET UNITS

In Canada: Sarco, Ltd., Toronto

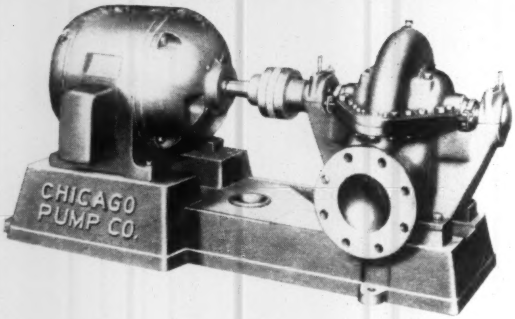
20 Variations

to match your individual room requirements


TYPE BT
FLOOR
WALL
CEILING
TYPE FF
FLOOR
WALL
CEILING
TYPE BF
FLOOR
WALL
CEILING
TYPE FT
FLOOR
WALL
CEILING
TYPE FE
DOOR BLANKETING UNIT (FLOOR MOUNTING ONLY)
LEFT HAND DISCHARGE
RIGHT HAND DISCHARGE

FROM *Chicago* **TOP QUALITY PUMPS**

Engineered for plumbing, heating, and air conditioning systems

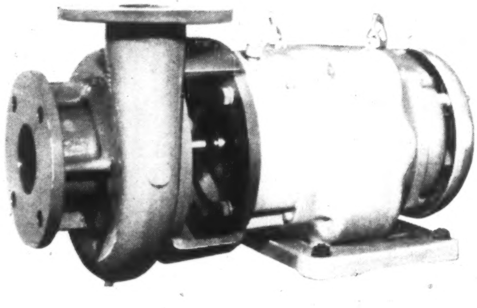


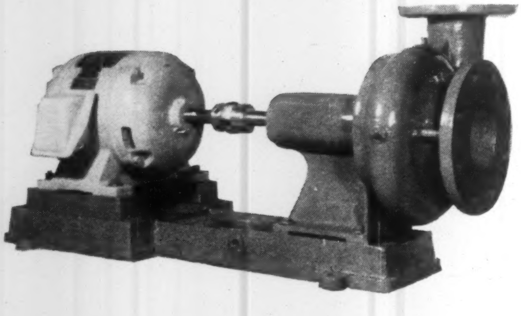
TYPE D DOUBLE SUCTION HORIZONTALLY SPLIT CASE PUMP

A rugged, heavy-duty pump that guarantees long, trouble-free service. The rotating assembly may be inspected without disconnecting the piping. Capacities up to 1900 G.P.M. Heads to 530 Ft. Described in Bulletin 101.

TYPE CC CLOSE COUPLED PUMP

Handles the toughest pumping jobs efficiently and in the least possible space. May be mounted in any position as long as the motor is not lower than the pump. Equipped with leak-proof mechanical seal. Capacities up to 500 G.P.M. Heads to 215 Ft. Described in Bulletin 108.





TYPE FC PEDESTAL MOUNTED FLEXIBLE COUPLED PUMP

Like the CC, all FC pumps are equipped with the most reliable mechanical seal ever built into a pump. Ceramic-faced stationary seat is highly resistant to wear. Accurately lapped surfaces and automatic adjustment for wear assures long life under strenuous service. Described in Bulletin 107.

For trouble-free, "worry-proof," efficient pumping at all times — specify Chicago Pumps. Write for complete information.

CHICAGO PUMP COMPANY
Subsidiary of Food Machinery and Chemical Corporation
BUILDING PUMP DIVISION
622 DIVERSEY PARKWAY • CHICAGO 14, ILLINOIS

Condo-Vac ®, Sure Return ®, AVC, LVC, Fire, House & Circulating Pumps, Pneumatic & Tankless Water Systems . . Flush Kleen ® Sewage Ejectors, Little Giant ® & Non-Clog Bilge Pumps. Pumps for every Industrial use.

LARGER SIZE RANGE

MIDWEST ELBOWS

IMPROVED DELIVERY

HEAVY WALL CARBON STEEL AND ALLOY

12" Long Radius
2¼" Wall Thickness
1¼% Chrome

20" x 10" Reducing
2" Wall Thickness
2¼% Cr—1% Mo.

STRAIGHT LONG RADIUS 90° ELLS

Nominal Pipe Size	Maximum Wall Thickness
36	1.250
30	2.000
26	2.000
24	1.500
20	1.375
18	2.250
16	2.125
14	1.750
12	2.000
10	2.000
8	1.750
6	1.000
5	.625
4	.750
3	.625
2½	.375
2	.500

These straight elbows can be furnished with LONG TANGENTS at no extra cost. All thicknesses less than those shown above are, of course, available.

The exclusive Midwest method of making all welding elbows from plate instead of tubing gives us a FLEXIBILITY OF MANUFACTURE that is much greater than by any other process. These heavy wall Midwest straight and reducing elbows are available in any material that can be secured as plate. The maximum wall thicknesses for which we now have equipment are indicated by the tables at left and right. And, because it is easier to get plate than tubing, better delivery is another advantage. Still another is the close tolerances inherent in our process.

Quality control goes beyond all code requirements. The longitudinal weld of every heavy wall elbow is completely X-rayed as standard procedure in our method of manufacture.

You will find it to your advantage to send us your inquiries.

REDUCING LONG RADIUS 90° ELLS

Nominal Pipe Size	Maximum Wall Thickness
30	2.000
26	*
24	2.000
20	2.000
18	2.000
16	1.500
14	1.750
12	2.250
10	2.000
8	1.750
6	1.000
5	.625
4	.750
3	.625
2½	.375
2	.500

Reductions to all nominal pipe sizes down to ½ large diameter. All thicknesses less than those shown above are, of course, available.
*Refer to factory.

MIDWEST PIPING COMPANY, INC.

Main Office: 1450 South Second St., St. Louis 4, Mo. • Plants: St. Louis, Clifton, N. J. and Los Angeles

Sales Offices

ASHEVILLE (BOX 446, SKYLAND, N.C.)
BOSTON 27—426 FIRST ST.
CHICAGO 3—79 WEST MONROE ST.
CLEVELAND 14—616 ST. CLAIR AVE.
HOUSTON 2—1213 CAPITOL AVE.
LOS ANGELES 33—520 ANDERSON ST.
MIAMI 34—2103 LE JEUNE RD.
NEW YORK 7—50 CHURCH ST.
ONEIDA, N.Y.—282 NORTH MAIN ST.
SAN FRANCISCO 11—420 MARKET ST.

STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

7675

TUBEMANSHIP CENTER OF THE LIGHTWEIGHT METALS BUSINESS

DECATUR, ALABAMA
PLANT

There used to be a time—remember—when all a company had to do to meet the demands of its customers was produce one type of its particular product.

It isn't that way any more. Take aluminum tube for example. To supply the aluminum demands of its customers, Wolverine maintains facilities for the production of both drawn and extruded tube. Each of these types is available in many sizes; in different alloys; in finned or prime surface form; in straight lengths, and in standard, medium and extra long coils.

And that isn't all by a long shot. Customers—requiring tubular shaped parts of aluminum—find that Wolverine has the facilities and the "know-how" for that type of production. Wolverine's fabrication facilities include spinning, finning, bending, coiling, flaring, beading, etc. —to name but a few. Aluminum services also include the production of rigidly quality controlled extruded aluminum shapes.

Anticipating customer demands and having the plants, equipment, experience and skilled employees needed to meet them is what Wolverine means when it refers to Tubemanship. Next time you need aluminum tube, tubular shaped parts or extruded shapes ask for a Wolverine quote before placing your order—make sure of products built the Wolverine Tubemanship way. Write, too, for Wolverine's General Products Catalog.

CALUMET & HECLA, INC.
CALUMET DIVISION
WOLVERINE TUBE DIVISION
FOREST INDUSTRIES DIVISION
GOODMAN LUMBER COMPANY
CALUMET & HECLA OF CANADA LIMITED
CANADA VULCANIZER AND EQUIPMENT COMPANY LIMITED

WOLVERINE TUBE
Division of Calumet & Hecla, Inc.
1461 CENTRAL AVENUE, DETROIT 9, MICHIGAN
Manufacturers of Quality Controlled Tubing and Extruded Aluminum Shapes

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES

EXPORT DEPT., 13 EAST 40TH STREET, NEW YORK 16, N. Y.

5705

PRITCHARD LOLINE COOLING TOWER—
SEVEN IMPORTANT WAYS BETTER!

1. The **LOLINE** has *galvanized* steel fan drive supports and basin accessories rather than cheaper, less durable painted steel.
2. The **LOLINE** brings grease fittings for the bearings on the V-belt drive to the outside of the tower for easier, safer maintenance.
3. The **LOLINE** features a *corrugated* asbestos cement board casing rather than flat asbestos cement board sheets—for greater strength and protection.
4. Lowest silhouette tower in the field, the **LOLINE** over-all height is just $7'\,7\frac{11}{16}''$.
5. Asbestos cement board louvers are installed as standard, not special, equipment on all **LOLINE** towers, for better appearance.
6. The **LOLINE** offers you an internal pipe supply system which permits the architect or engineer to completely conceal the piping. This is optional equipment.
7. The V-belt drive on all **LOLINE** towers features a stainless steel fan shaft for longer tower life.

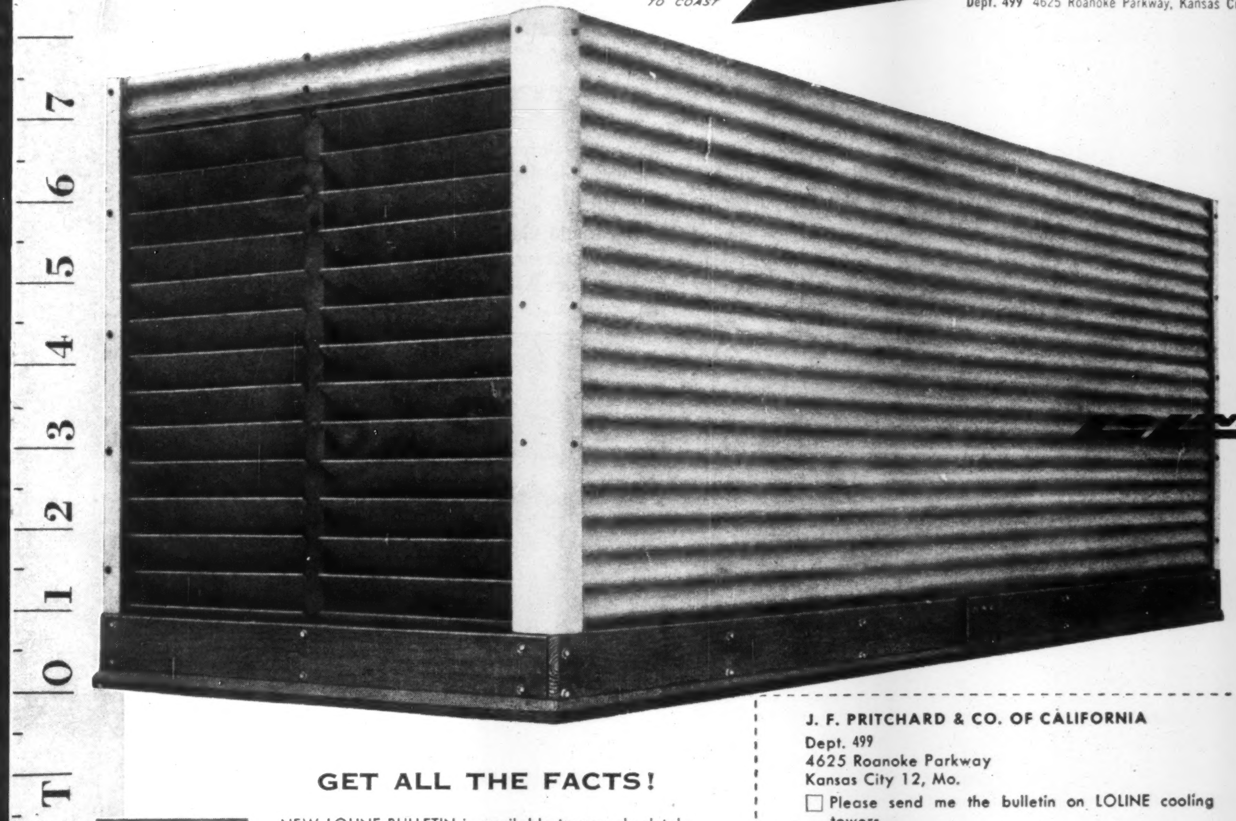
INDUSTRY'S PARTNER FOR PROGRESS

See Pritchard LoLine Cooling Towers, Booth N-343, International Heating & Air Conditioning Exposition, Chicago, Feb. 25-March 1.

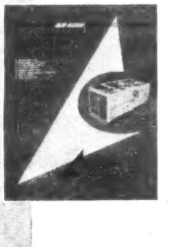
COOLING TOWERS
GAS & AIR TREATING EQUIPMENT

REPRESENTATIVES IN PRINCIPAL CITIES FROM COAST TO COAST

J. F. Pritchard & Co.
OF CALIFORNIA
A DIVISION OF J. F. PRITCHARD & CO.
Dept. 499 4625 Roanoke Parkway, Kansas City 12, Mo.



GET ALL THE FACTS!



NEW LOLINE BULLETIN is available to you absolutely free of cost or obligation. Tells you *all* the facts about the lowest silhouette tower of 75 tons capacity and up now available: Why the LOLINE was developed, illustrations and descriptions of framework and mechanical equipment, typical cross section, capacity table, optional equipment, name and address of Pritchard sales office nearest you. Send for your complimentary copy today.

J. F. PRITCHARD & CO. OF CALIFORNIA
Dept. 499
4625 Roanoke Parkway
Kansas City 12, Mo.

☐ Please send me the bulletin on LOLINE cooling towers.

☐ Please have your representative contact me.

Name ____________________

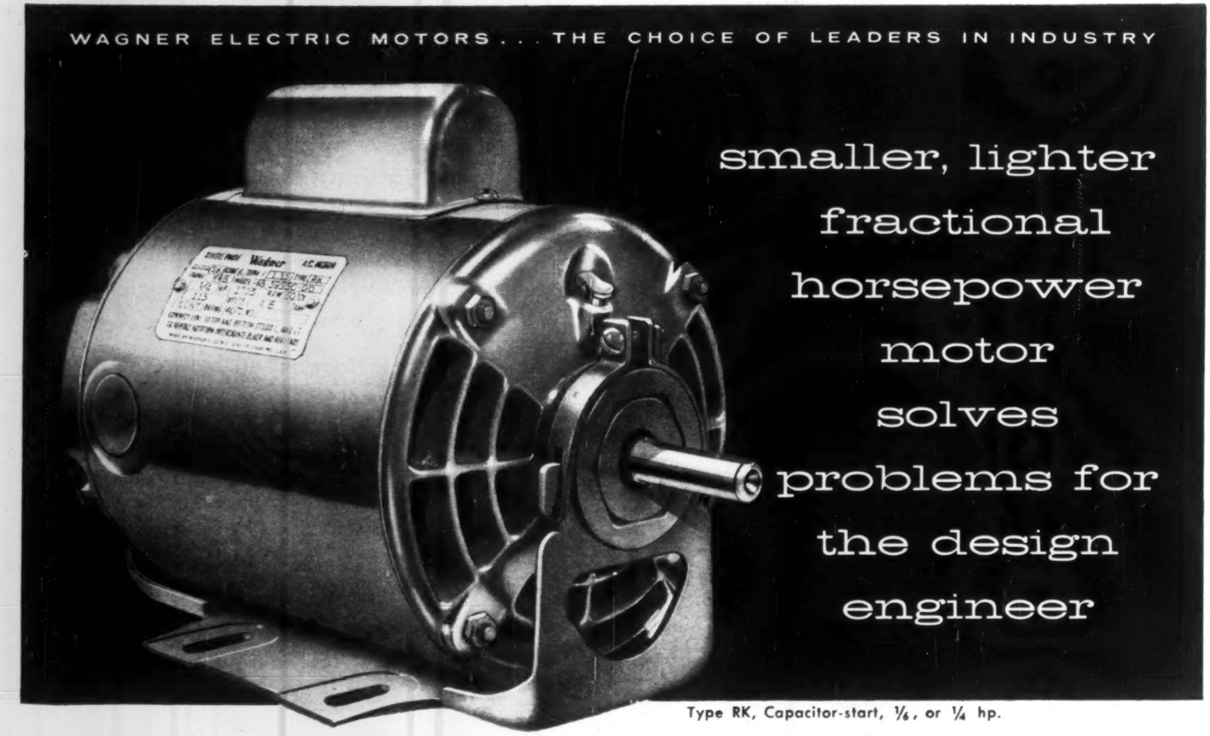
Title ____________________

Firm ____________________

Address ____________________

City ________ **Zone** ____ **State** ________

WAGNER ELECTRIC MOTORS . . . THE CHOICE OF LEADERS IN INDUSTRY



smaller, lighter fractional horsepower motor solves problems for the design engineer

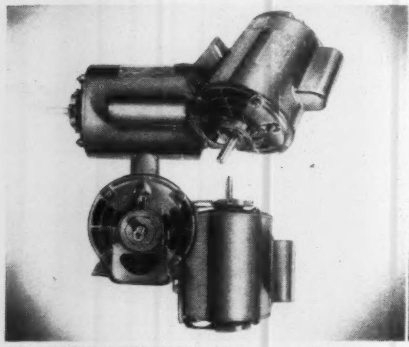
Type RK, Capacitor-start, ⅙, or ¼ hp.

the WAGNER "48"

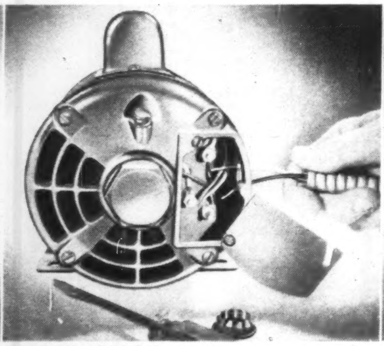
Here's the 48 frame motor you've been looking for! The Wagner "48" capacitor-start motor with either resilient or welded rigid base. You get the standard 48 frame size, with from *three to eight pounds less weight per motor* than previous models of the same hp ratings!

The Wagner "48" is rugged enough to permit direct mounting, compact enough to fit in tight spots, will operate efficiently when mounted at any angle. Through ventilation assures cool operation that adds to motor life.

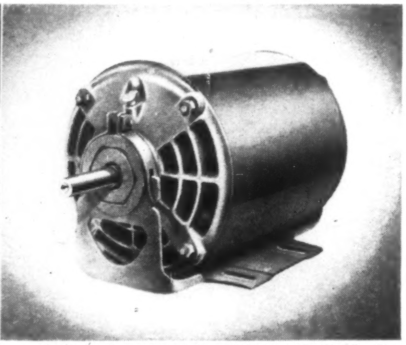
If you would like to test the Wagner "48", one of our field engineers will be glad to furnish a sample motor. Contact the Wagner Branch near you or write to the factory.



ALL ANGLE OPERATION. You can mount the Wagner "48" at any angle. A new lubrication system assures positive protective lubrication in any position.



EASY TO CONNECT. Just loosen one screw for access to terminal board. **EASY TO SERVICE** . . . no need to disconnect leads when removing endplates.



ALSO AVAILABLE IN SPLIT-PHASE TYPE. The Wagner "48" is also furnished in split-phase type, with resilient or rigid base in ratings of ⅙, ¼ and ⅓ hp.

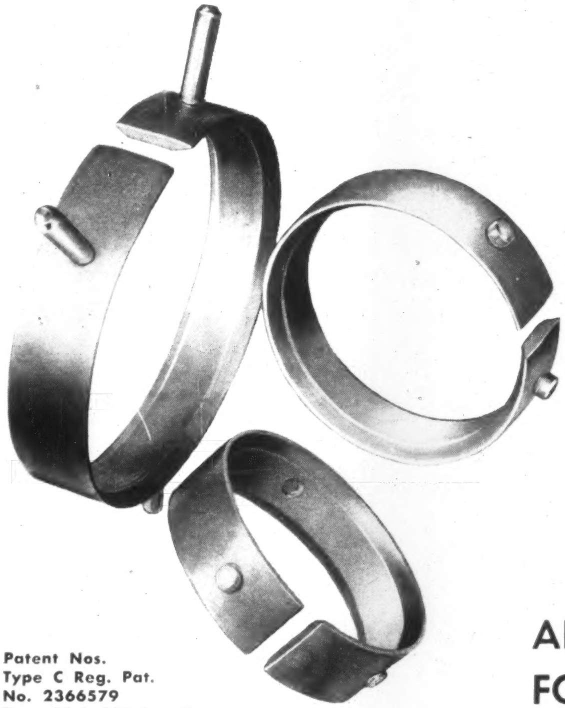
Wagner Electric Corporation
SERVING INDUSTRY SINCE 1891

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

Wagner Electric Corporation
6370 Plymouth Ave., St. Louis 14, Mo., U.S.A.

H57-2

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC



Patent Nos.
Type C Reg. Pat.
No. 2366579
Type CC & CCC Reg. Pat.
No. 2764426

ROBVON BACKING RINGS

APPROVED BACKING RINGS FOR WELDED PIPE, VALVES, AND FITTING JOINTS

AVAILABLE IN CARBON STEEL, WROUGHT IRON, CHROME ALLOYS, STAINLESS STEEL, ALUMINUM AND COPPER.

TYPE CCC	Designed for quick easy alignment of pipe where the variation in inside diameters is relatively great. Chamfered NUBS allow close tolerance fit-up and CLEAN STRIKE OFF. The ROBVON NUB conforms to the diameter of weld rod. ROBVON rings are beveled to assure non-restricted fluid flow.
TYPE CC	Designed to allow quick easy alignment of pipe where the inside diameters are slightly out of round. The welder has the choice of "STRIKING OFF" the NUBS or leaving them intact to be melted into the weld mass of the first root pass.
TYPE C	Designed for precise close tolerance fit-up. Type "C" NUBS conform to the diameter of the weld root. The NUBS melt with the metal to give complete penetration and fusion.

ROBVON ALSO MANUFACTURES MACHINED RINGS
TO CUSTOMERS SPECIFICATIONS.
ALL FABRICATED SOLID MACHINE RINGS X-RAYED

WRITE FOR FULL INFORMATION

ROBVON
BACKING RING COMPANY

675 GARDEN STREET **ELIZABETH, NEW JERSEY**

Cleaver-Brooks presents . . .

A REVOLUTIONARY NEW DEVELOPMENT IN THE ART OF BURNING RESIDUAL OILS

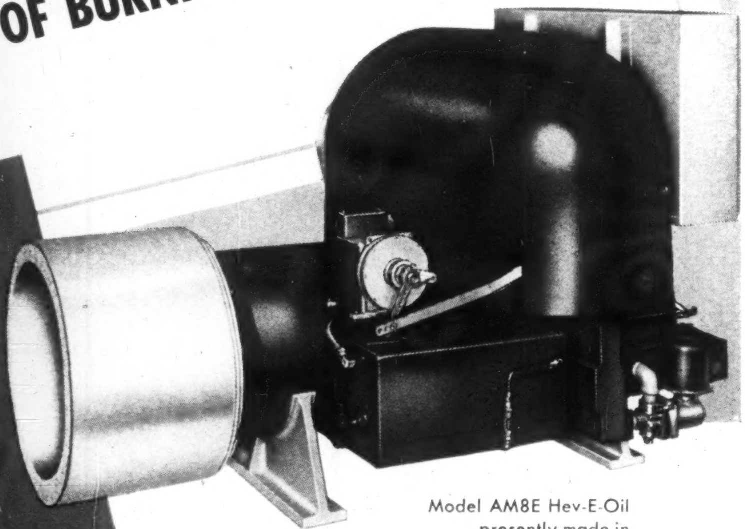
Hev-E-Oil

THE FIRST AIR-ATOMIZING

Burner

DESIGNED FOR

No. 6 Oil



Model AM8E Hev-E-Oil
presently made in
90 gph size only.

. . . A TRIUMPH IN MODERN COMMERCIAL HEATING

NOW — for the first time in the industry — an air atomizing, gun-type burner designed for No. 6 or Bunker C oil. Previous methods of burning residual oils — with their inefficiencies and high maintenance — are now obsolete.

This great forward step in modern oil burning practice is another example of Cleaver-Brooks' leadership in burner research and engineering.

- No. 6 oil finely atomized — easily and completely burned.
- Burner equipped to bring hot oil to burner nozzle — ready for a perfect start at all times.
- Oil and air measured at all capacities — high CO_2 is maintained under all stack conditions.
- Straight electric ignition available.
- Pressurized lubrication increases service life.
- Fast installation — simple as a domestic burner.
- Latest type electronic controls are standard equipment — burner completely wired at factory.
- Burner completely fire-tested at factory.
- Low fire start — standard equipment.
- High-low modulation — standard equipment.
- Complete modulation available at slightly higher cost.
- Low and high fire easily set for most economical operation.
- Shape of flame can be adjusted for each particular installation.
- Post-purge insures no-drip, sure starting.
- Burner requires a minimum of service, a quality product made by Cleaver-Brooks — a leader in the development of combustion equipment.

Cleaver Brooks

DEALERS AND DISTRIBUTORS . . . write today — get the complete details on the new HEV-E-OIL Burner for No. 6 oil. CLEAVER-BROOKS COMPANY, Dept. A, 313 E. Keefe Ave., Milwaukee 12, Wisconsin.

HEV-E-OIL Burners . . . a quality product that builds your profit

Placed end to end, the Beth-Co-Weld pipe used in new homes at Lakewood, Calif., would extend from San Francisco to Miami. Pipe Contractors: J. D. Ross Company, Los Angeles, and Hartshorn Brothers Plumbing Co., Bellflower. Pipe Jobber: Familian Pipe & Supply Co., Inc., Los Angeles.

3,200 Miles of Beth-Co-Weld In New Homes at Lakewood, Calif.

The growth of Lakewood, Calif., has been phenomenal — from a population of 15,000 in 1949 to about 90,000 today. In the years 1950-1954 alone, some 31,000 attractive residences were constructed at Lakewood. In the piping layouts for these homes a total of 3,200 miles of Beth-Co-Weld steel pipe was used.

Beth-Co-Weld is an excellent plumbing and heating pipe, not only for the home-building field, but for industrial installations as well. Beth-Co-Weld saves time because it's easy to cut and thread. It has a sound weld, too, because it's made by the continuous-weld process from a good grade of carbon steel.

Most pipe jobbers furnish Beth-Co-Weld in these size ranges in 21-ft lengths, plus or minus 1 in., and in random lengths:

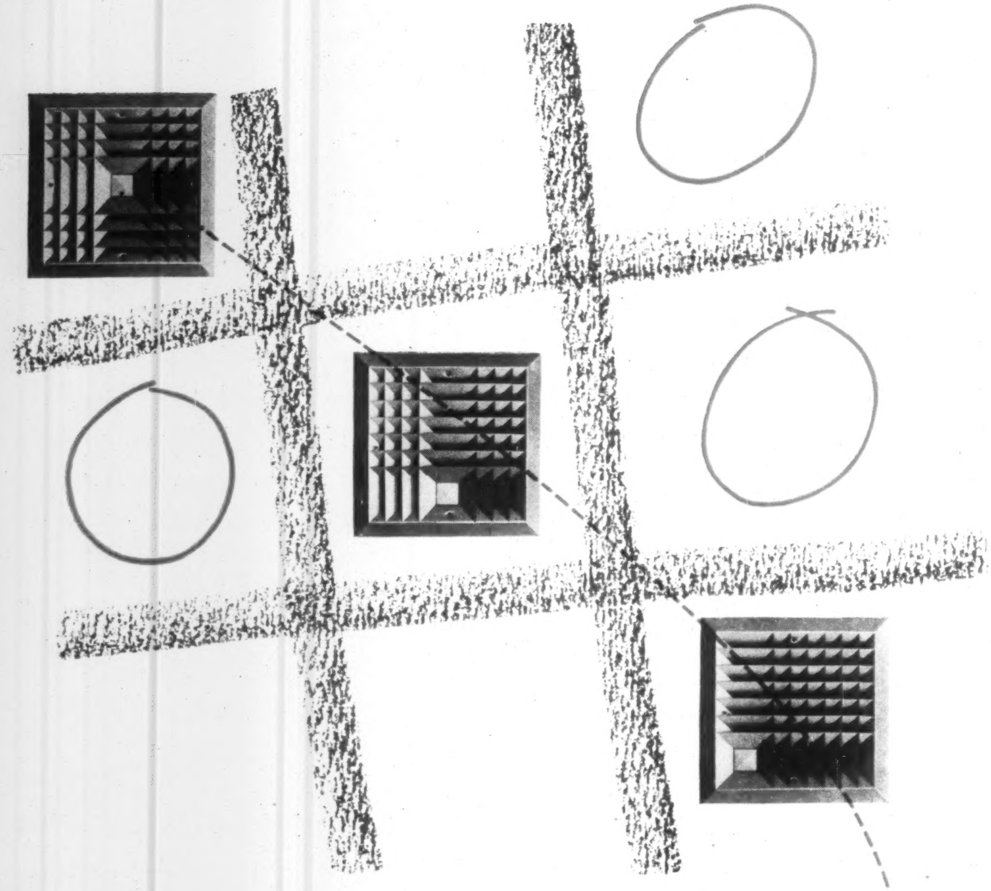
Standard, ½ in. to 4 in.

Extra Strong, ½ in. to 3 in.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corp. *Export Distributor:* Bethlehem Steel Export Corp.

BETHLEHEM STEEL



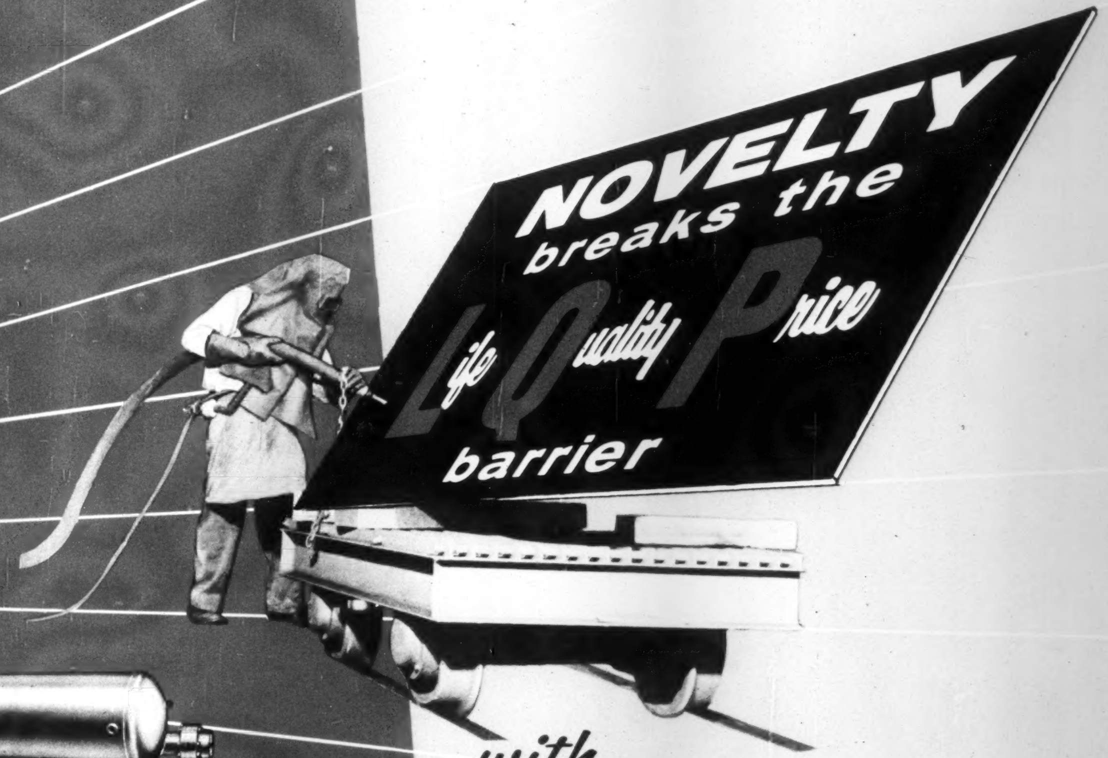
You've picked a winner!

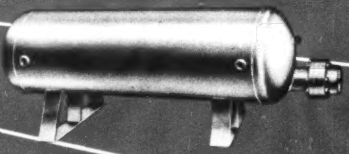
ADP diffusers are designed for better air distribution, with greater free areas and a high mixing action to assure top performance. A complete range of sizes in squares and rectangles to meet any job requirement. Available in all face patterns and with a choice of standard, flat or a tile replacement frame. The smart trim appearance for today's modern decor.

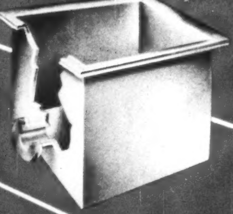
Visit ADP at the Chicago Exposition.

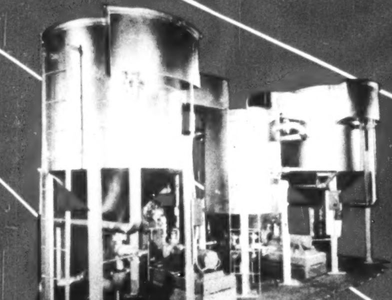
AIR DISTRIBUTION PRODUCTS

116 South La Brea Avenue **Los Angeles 36, California**









with NOVELON *Linings*

Now—Better Products at Lower Prices because Novelty has broken the Life-Quality-Price barrier with Novelon Linings.

Novelty has combined its fifty years of building unfired pressure vessels and storage tanks—with ten years of developing a complete line of Novelon Linings to solve the corrosion problems of most known fluids or chemicals.

This enables us to offer the highest Quality vessels—giving the longest possible life—at the lowest possible price.

Specify NOVELTY
THERE'S NO EQUAL

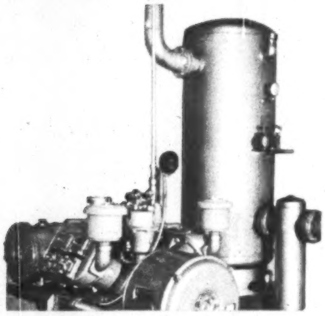
NOVELTY
STEAM BOILER WORKS, INC.
CLARE AND KLOMAN STREETS
BALTIMORE 30, MARYLAND

Subsidiary of Ellicott Machine Corporation

longer LIFE
built-in QUALITY
lower PRICE

NOVELTY
STEAM BOILER WORKS, INC.

FIFTY YEARS OF FABRICATING
UNFIRED PRESSURE VESSELS



Air and Vacuum Receivers

The demand for receivers capable of handling high working pressures has been increasing each year. By successfully utilizing higher tensile steels and good engineering techniques Novelty can furnish receivers from 10" vacuum to 10,000 psig. pressure.

NOVELON *Linings*

Stop Corrosion . . .
Add Years of Life

For many years purchasers of vessels had to choose between the relatively low cost and quality of carbon steel tanks—and the more expensive vessels of special steels and alloys that offer long life and resistance to corrosion. Novelty has now broken this Life-Quality-Price barrier by successfully combining low-cost steel vessels with custom Novelon Linings that meet the use requirements of the vessels.

A complete range of linings are now available that can resist the corrosive action of most known fluids or chemicals. Send us your corrosion problem and let Novelty's engineers give you the answer.

• *Special* METALS

As a pioneer in the anti-corrosion field, Novelty has successfully solved many problems involving the use of steel alloys and non-ferrous metals in the fabrication of vessels and entire systems. Some of the more important special metals and alloys are:

Copper Silicon—particularly recommended for water storage, because of its fine corrosion-resistant properties.

Clad Steels—inseparably bonded steel and claddings of corrosion resistant Nickel, Monel, Copper and the various stainless steels offer long life.

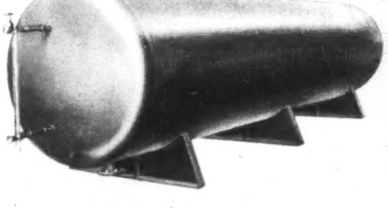
Stainless Steel—a wide selection is available possessing high strength, good ductility, oxidation resistance and good abrasion resistance.

Nickel—particularly resistant to alkalies, such as caustic soda, caustic potash; salts, both acid and alkaline.

Monel—a strong and ductile alloy of copper and nickel that is resistant of all kinds of water, acids and salts.

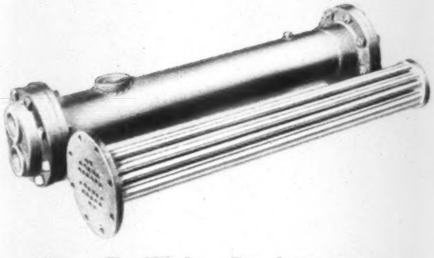
Inconel—an alloy of Nickel, Chromium and Iron that is extremely resistant to scaling at high temperatures.

Aluminum—gives light-weight construction and freedom from rust or tarnish. Many strong alloys and clads of aluminum are now available.



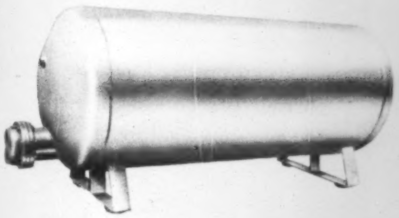
Storage Tanks

Storage tanks can be lined with a Baked-on Plastic Lining that will protect against contamination and will add years of useful service.



Heat Transfer Equipment

Novelty has successfully fabricated jobs requiring Straight tube, U-tube and floating heads. A wide range of material, from aluminum to zinc coated carbon steel, is available.



Hot Water Generators

Baked-on Plastic Linings are particularly recommended for Hot Water Generators to insure clear, rust and chemically free water—even in "poor water areas" of the country.

PLASTIC LININGS—Baked-on plastic linings are thermosetting plastic coatings that are the most successful anticorrosion measures developed for steel tanks. There are five basic advantages in their use: (1) low initial cost, (2) heat resistance—up to 500° F., (3) smooth, non-porous, easy to clean surface, (4) no color, odor or taste imparted to contents, and (5) excellent resistance to deterioration. Vinyl, phenolic and epoxy resins are furnished depending on the temperature conditions and fluid media.

PLASTIC SHEET LININGS—heavier sheet plastics, such as PVC are used for severely corrosive fluids.

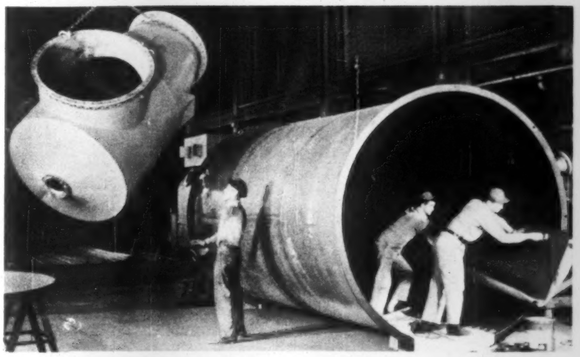
PLASTISOLS—seamless; cured—afford maximum resistance to chemicals.

RUBBER LININGS—Neoprene and natural rubber in sheet or liquid form; air dried or heat cured.

COPPER LININGS—of sheet copper, with expansion joints and openings of copper silicon.

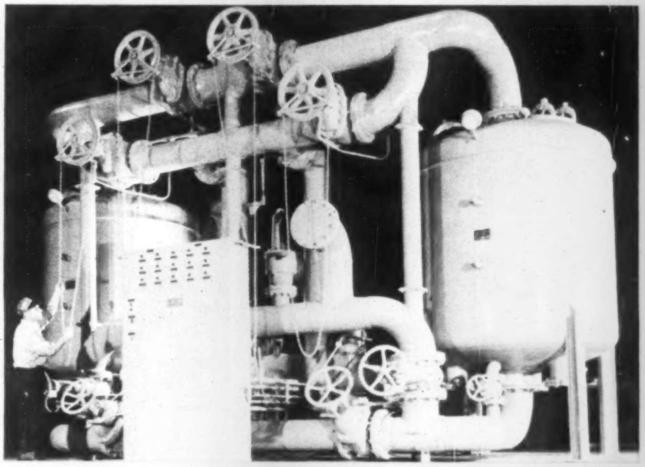
CEMENT LININGS—water-resistant, hydraulic cement and silica composition of thicknesses from ½″ to 1″, with or without metal lath reinforcement.

Correct application technique is the secret of the long life of Novelon Linings—Novelty's modern facilities include large baking and curing ovens, dust-free application room, highly skilled personnel and rigid quality control measures. A variety of sandblasting techniques and grits are available for the proper preparation of surfaces before lining. A lining or protective coating is only as good as the application.



NOVELTY
special fabrication

Novelty has the ability and experience to do a wide range of special fabrication work. Our experience includes manual and automatic welding of most types of metals, alloys and clads to meet ASME—API and other exacting codes. The Novelon Lining department offers unmatched experience in solving almost any corrosion problem. In conjunction with our parent company, the Ellicott Machine Corporation, we can offer complete heavy machine shop facilities. Call for a qualified Sales Engineer to help work out the details on your next fabrication project.



Fabricated for The C. M. Kemp Mfg. Co.

THESE REPRESENTATIVES HELP . . .

Novelty break the LQP barrier

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Chattanooga, Tennessee
Phone 7-8511

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Stratford, Connecticut
Drexel 8-3576

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Mussun Equipment Co.
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Cleveland 3, Ohio
Utah 1-5244

Toledo, Ohio
Skeldon Power Equipment Co.
1815 No. 13th Street
Toledo, Ohio
CH 3-9516

Michigan
Heating Equipment Co.
19635 Schoolcraft
Detroit 23, Michigan
Vermont 6-8207

St. Louis, Missouri
Mechanical Works Engineering
P. O. Box 71
Clayton 5, Missouri
Volunteer 3-6050

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New York 7, N. Y.
BArclay 7-4839

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Globe Life
Oklahoma City 2, Oklahoma
RE 6-4668
H. W. Meinholtz
P. O. Box 2261
Tulsa 1, Oklahoma

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Rodgers Engineering Company, Inc.
1925 Record Crossing Road
Box 10546
Dallas 7, Texas
DIxon 4821

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J. F. Scouler Co.
221 N. 2nd Street
Harrisburg, Penna.
Cedar 6-0742

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Atkinson & Lawrence, Inc.
38 North Main Street
Natick, Massachusetts
Tel. Boston KEnmore 6-3990

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4318 Penn Avenue
Pittsburgh 24, Penna.
Museum 3-2500

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2067 Beechmont Ave.
Cincinnati 30, Ohio
BE 1-8722

New Orleans
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340 Audubon Blvd.
New Orleans 25, La.
Walnut 2268

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Kenmore 17, New York
RIverside 6483

Texas — Southern
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San Antonio, Texas
PE 4-4534

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Tel. 72-7480

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Moline 4-9812

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Bill Newton
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Ralph Hyer
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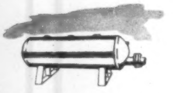
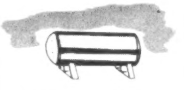
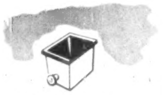
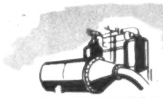
Contact the nearest representative or write directly to home office.

NOVELTY
STEAM BOILER WORKS, INC
SUBSIDIARY OF
ELLICOTT MACHINE CORPORATION


HOT WATER GENERATORS


STORAGE TANKS


SPECIAL LININGS


SPECIAL FABRICATION

NOVELTY STEAM BOILER WORKS, INC.
CLARE AND KLOMAN STREETS • PLAZA 2-0425 • BALTIMORE 30, MARYLAND

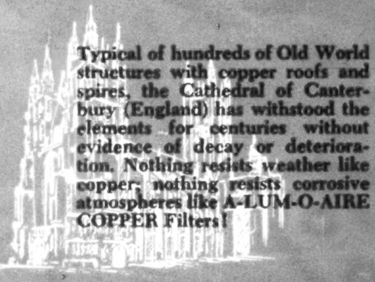
stop wasting money on '*throw-aways*' with new

A-lum-O-Aire Copper FILTERS

designed **for industrial air-cleaning requirements**

All standard ½", 1" and 2" sizes or built to your specifications.

Enlarged section showing mat, retainer and frame construction. Frames are aluminized steel for extra strength and light weight.



Typical of hundreds of Old World structures with copper roofs and spires, the Cathedral of Canterbury (England) has withstood the elements for centuries without evidence of decay or deterioration. Nothing resists weather like copper; nothing resists corrosive atmospheres like A-LUM-O-AIRE COPPER Filters!

RESISTS RUST and CORROSION

Impervious to hazardous industrial atmospheres, new A-LUM-O-AIRE COPPER Filters are the practical solution for handling corrosion and moisture-laden fumes, vapors and gases. Copper wool, used as the filter media, is manufactured by Carey to precision standards from special alloys developed expressly for air cleaning. Mat retainers are copper plated for longer life with added protection against rusting and corrosion.

QUICKLY CLEANED for CONTINUOUS USE

Simply flush A-LUM-O-AIRE COPPER Filters with water or solvent and replace. No hazardous oils to add; no messy adhesives required. END pyramiding filter replacement costs NOW with the filter designed for the rugged demands of industry. Available in standard and high-velocity types for normal resistance or engineered to your specific size and capacity requirements.

Carey
ELECTRONIC ENGINEERING CO.
METAL WOOL DIVISION
SPRINGFIELD, OHIO

"world's largest manufacturers aluminum and copper wool"

If filtered air is important to your production or operating schedules, here NEWS you can't afford to pass up! Why? Because A-LUM-O-AIRE COPPER Filters save on replacements, eliminate maintenance expense and increase air cleaning efficiency!

Like to see the proof? Then, write for folder showing typical performance curves and operating data — or send us your specifications with prints or detailed drawings for prompt recommendations and quotations. No charge or obligation, of course!

America's first practical recleanable all-metal, dry-type air filter! Approved by Underwriters (Class 1)!

A-lum-O-Aire

MAIL THIS COUPON TODAY

Carey Electronic Engineering Co.
Metal Wool Division Dept. H-17
1880 Clifton Avenue
Springfield, Ohio

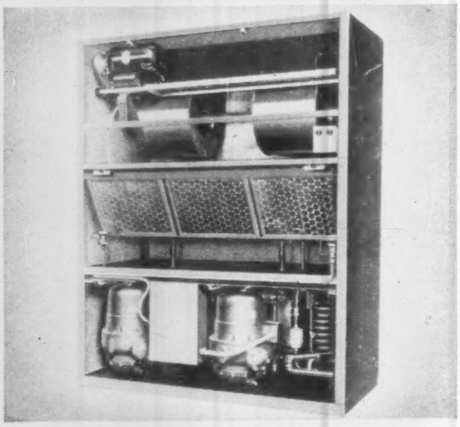
☐ send folder

☐ we're sending data for quote

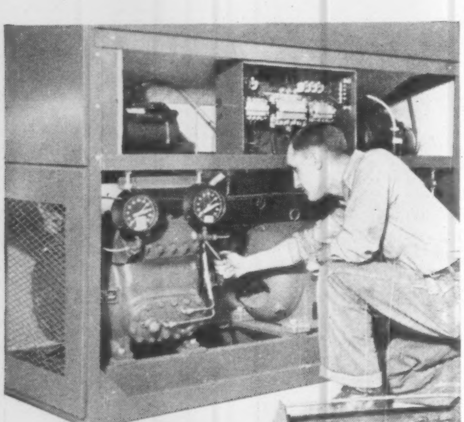
Tell me more—
about your new A-LUM-O-AIRE Filters and show me how we can save money on our air-cleaning activities.

Name __________ Title __________
Company __________
Address __________
City __________ Zone ____ State __________

Sound-sealed, compact. Interior view shows full utilization of space which makes TRANE unit so trim. Note, too, how refrigeration equipment is virtually sealed away in its own independent compartment.



TRANE 10 and 15-ton deluxe air conditioners. Note dual refrigeration cycle using hermetic compressors.



Larger sizes, too. 10, 15 and 20-ton models with or without evaporative condensers. Delivered with all internal wiring and piping completed. As their heart, they have TRANE Reciprocating Compressors, famed for long life, easy servicing, with complete interchangeability of parts.

THE TRANE COMPANY, LA CROSSE, WIS. • EASTERN MFG. DIV., SCRANTON, PA.
TRANE COMPANY OF CANADA, LTD., TORONTO • 90 U.S. AND 19 CANADIAN OFFICES

So quiet you

Modern "Iso-Sound" design

Even if you're seated as near a TRANE Self-Contained Air Conditioner as the people in this picture—*you can't hear the compressor cut in!*

It's because TRANE has completely redesigned the usually noisy elements of packaged air conditioners to bring you whisper-quiet operation.

In the mechanical refrigeration section, specially designed parts reduce vibration, minimize noise.

Centrifugal fans are twice tested for quietness. Fan housings are *tight* to prevent noisy air leaks.

With new TRANE "Iso-Sound" design, both fan and compressor sections float independently on sound and vibration isolators.

can't hear it start !

compressor plus exclusive Trane assures smooth, vibration-free operation!

The result: the smoothest, quietest package unit in TRANE history. One you can confidently specify for clients who want *quiet* as well as *comfort*. And trim, slim beauty in cabinet design, too!

TRANE Self-Contained Air Conditioners are bringing *big system* performance to stores, shops and offices and factories all over the nation.

The complete TRANE line includes package units from 3 to 20 tons—other equipment to 1,500 tons—to handle any size or type of job.

For full data on the TRANE packaged line for 1957, call your nearby TRANE Sales Office or write TRANE, La Crosse, Wisconsin.

For any air condition, turn to

TRANE

MANUFACTURING ENGINEERS OF HEATING, COOLING, VENTILATING AND HEAT TRANSFER EQUIPMENT

Jenni Genetron says, "HERE'S THE

genetron 11

TRICHLOROMONOFLUOROMETHANE

Refrigerant in industrial and commercial refrigeration and air conditioning systems utilizing single or multi-stage centrifugal compressors. Also for direct or indirect expansion-type systems.

genetron 12

DICHLORODIFLUOROMETHANE

Most widely used organic fluorine refrigerant. For virtually all types of refrigeration and air conditioning equipment, large and small, direct and indirect expansion systems.

genetron 22

MONOCHLORODIFLUOROMETHANE

Used in reciprocating compressors for package type air conditioners, home freezers and industrial processes requiring a lower-temperature refrigerant.

genetron
11
ORANGE LABEL

genetron
12
WHITE LABEL

genetron
22
GREEN LABEL

Selected Physical Data

(Performance based on 5°F evaporator temperature and 86°F condenser temperature)

	genetron 11	genetron 12	genetron 22
Chemical Formulae	CCl_3F	CCl_2F_2	$CHClF_2$
Molecular Weight	137.4	120.9	86.5
Boiling Pt. (°F) at 1 Atm. Pressure	74.7	—21.6	—41.4
Evaporator Pressure at 5°F (p.s.i.g.)	24.0*	11.8	28.3
Condensing Pressure at 86°F (p.s.i.g.)	3.6	93.3	159.8
Freezing Point (°F) at 1 Atm. Pressure	—168	—252	—256
Critical Temperature (°F)	388	234	205
Critical Pressure (p.s.i. absolute)	635	597	716
Compressor Discharge Temperature (°F)	112	101	131
Compression Ratio (86°F/5°F)	6.24	4.08	4.06
Specific Volume of Saturated Vapor at 5°F (cu. ft./lb.)	12.27	1.46	1.25
Latent Heat of Vaporization at 5°F (B.t.u./lb.)	84.0	68.2	93.6
Net Refrig. Effect of Liquid—86°F/5°F (B.t.u./lb.)	67.5	50.0	69.3
Specific Heat of Liquid at 86°F (B.t.u./lb. °F)	0.21	0.24	0.34
Specific Heat of Vapor at Constant Pressure of 1 Atm. & 86°F (B.t.u./lb. °F)	0.13	0.15	0.15
Specific Heat Ratio at 86°F & 1 Atm. (k=Cp/Cv)	1.14	1.14	1.18
Coefficient of Performance	5.09	4.70	4.66
Horsepower/Ton Refrigeration	0.927	1.002	1.011
Refrigerant Circulated/Ton Refrig. (lbs./min.)	2.96	4.00	2.89
Liquid Circulated/Ton Refrig. (cu. in./min.)	56.0	85.6	68.0
Compressor Displacement/Ton Refrig. (c.f.m.)	36.32	5.83	3.60
Toxicity (Underwriters' Laboratories Group No.)	5A	6	5A
Flammability & Explosivity	None	None	None

*Inches of mercury vacuum.

RIGHT REFRIGERANT FOR EVERY NEED!"

genetron 113

TRICHLOROTRIFLUOROETHANE

Used in 25-ton and larger centrifugal compressors, primarily for large comfort cooling systems, brine cooling systems, and other commercial and industrial air conditioning and refrigeration systems.

genetron 114A

DICHLOROTETRAFLUOROETHANE

Used in centrifugal and rotary compressors for commercial, industrial and household refrigeration.

genetron
113
PURPLE LABEL
genetron
114A
DARK BLUE LABEL

genetron 113	genetron 114A
$\mathrm{C_2Cl_3F_3}$	$\mathrm{C_2Cl_2F_4}$
187.4	170.9
117.6	37.6
27.9*	15.6*
13.9*	22.7
—31	—76
417	294
495	478
86	88
8.02	5.33
27.04	4.04
70.6	60.2
53.7	43.0
0.22	0.23
0.15	0.16
1.09	1.01
4.92	4.60
0.960	1.025
3.73	4.65
66.5	88.7
100.76	18.78
4-5	6
None	None

genetron®

SUPER-DRY REFRIGERANTS

COMPARE!

Careful control at every step in the manufacture of "Genetron" Super-Dry Refrigerants results in products of highest purity, which are extremely low in moisture content and other undesirable impurities. The quality of current production consistently surpasses the rigid manufacturing specifications listed for these products.

- **Guaranteed exceptionally low moisture content**
- **Non-corrosive to standard equipment materials**
- **Non-toxic, non-flammable, stable, safe**
- **Critical and freezing points well outside range of operating uses**
- **Solvent action on oil helps prevent solidification or congealing of lubricant**
- **Aid in lubrication of equipment; generally miscible with oil**
- **Freely interchangeable and may be mixed in any proportions with comparable fluorinated hydrocarbon refrigerants meeting the same strict refrigerant specifications**
- **Approved and certified as original or replacement charge by leading refrigeration equipment manufacturers**
- **Available everywhere . . . see your refrigeration wholesaler**

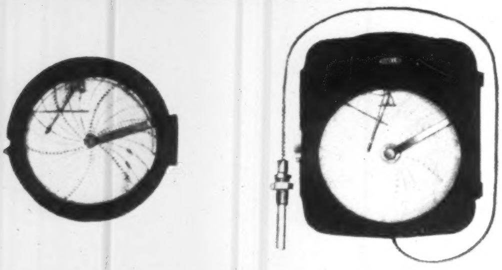
GC
Allied Chemical

For further information
SEE YOUR
REFRIGERATION WHOLESALER
or call or write

genetron DEPARTMENT
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

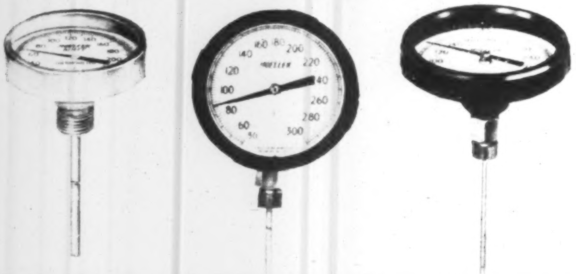
For Easy Accurate Reading...

MOELLER THERMOMETERS



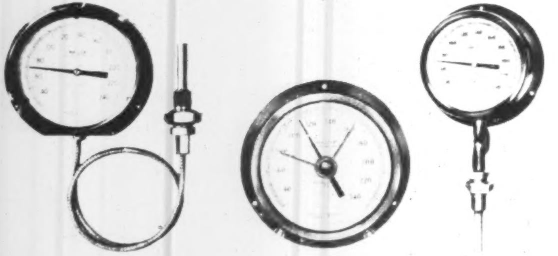
RECORDING THERMOMETERS

Mercury Actuated, made in round or rectangular cases. Charts 10" or 12", 1-hour, 12-hour, 24-hour or 7-day. Ranges from minus 40° to plus 1000°F. or its equivalent in Centigrade. Made in remote reading, direct reading, portable and self-contained styles. Plain stems, union connection stems, and separable sockets in all stem lengths and alloys.



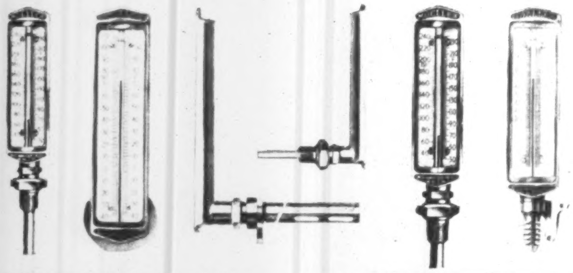
MOELLER BI-METAL THERMOMETERS

Are actuated by a powerful, specially processed bi-metal helix. Made with 3" and 4½" diameter dials. Stainless stems, can be furnished with union connection or separable sockets. Scale ranges from minus 100° to plus 1000°F.



DIAL INDICATING THERMOMETERS

Mercury Actuated, made in 4½", 6" and 8½" sizes with flexible extension tubing. Adjustable rigid stems, single or two pointers, with or without electrical contacts, plain bulb, union connection bulb or separable sockets in all lengths and alloys. Scale ranges from minus 40° to plus 1000°F. or its equivalent in Centigrade.



MOELLER INDUSTRIAL THERMOMETERS

Made in all forms — Straight, Angle, Right Side Angle, Left Side Angle, Reclined and Inclined Angles, in scale ranges from minus 120° to plus 1125°F. or its equivalent in Centigrade. Available in 5", 7", 9" and 12" scale sizes with plain stems, union connection stems and separable sockets in all stem lengths and alloys.

Send for Literature on these Moeller Products and Recording Psychrometers, Test Wells, Hydrometers, Engraved Stem Thermometers, and Vacuum Gauges.

MOELLER INSTRUMENT COMPANY
SINCE 1867
DEPT. H RICHMOND HILL 18, NEW YORK CITY

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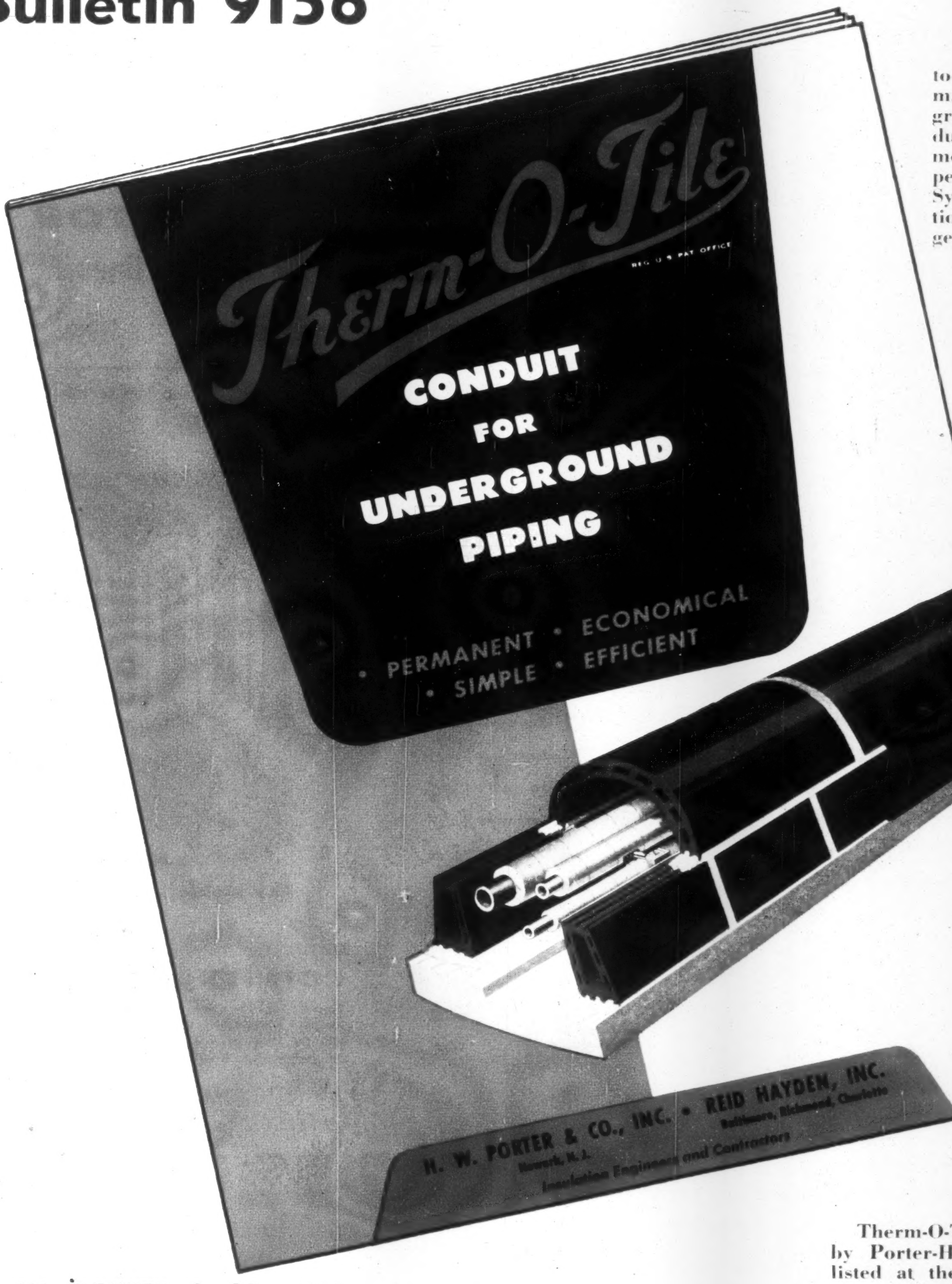
Therm-O-Tile
Bulletin 9156

NEW!

12 pages of up-to-the-minute information on underground pipe conduits, including the modern High Temperature Hot Water System. Specifications. Design suggestions.



Therm-O-Tile

REG. U.S. PAT. OFFICE

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FOR
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• PERMANENT • ECONOMICAL
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INSTALL IT...FORGET IT!

Flexon®

PACKLESS EXPANSION COMPENSATOR

the no-maintenance way to take up expansion in heating lines

EXPANSION
COMPENSATOR
PRESSURE SYSTEMS
MAXIMUM STROKE 1/2"
MAXIMUM PRESSURE 40 pounds
FLEXONICS CORPORATION

PAGES MISSING IN

Specify it and install it now . . . forget it for the life of the building! There's no easier way to tell you the really important facts about the Flexon Expansion Compensator.

And there's no easier way to take care of pipe and tubing expansion, either. Flexon Expansion Compensators take little more space than the pipe or tubing that they replace. A mechanic can install one in minutes. Thousands of installations have proved them.

Standardize on this simple specification: Flexon Expansion Compensators for horizontal and vertical lines – Model L for low pressures – Model H for higher pressures. Write today for design and cost data.

The inside story

CONSTRUCTION

The bellows is fabricated from two plies of specially-rolled metal to combine strength with flexibility. Bronze bellows for Model L; stainless steel for Model H.

Flexonics
corporation

EXPANSION JOINT DIVISION • 1391 S. THIRD AVENUE, MAYWOOD, ILLINOIS

EXPANSION JOINTS · METAL HOSE · NON-METALLIC HOSE · BELLOWS · AIRCRAFT COMPONENTS

WE'RE *Mighty Proud* OF YOUNGSTOWN'S DISTRIBUTORS

Youngstown Distributors are in business for only one reason—to quickly supply what you want, when you want it, and in the quantity you require. They provide you the highest quality Youngstown Pipe at the right price—by coordinating their distribution with our mill production. Yes, our hat's really off to these valuable around-the-clock suppliers for the important function they daily perform to industry.

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7 Points of uniform goodness

uniform ductility
uniform lengths
uniform threading
uniform weldability
uniform wall thickness and size
uniform strength and toughness
uniform roundness and straightness

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PRODUCERS OF QUALITY CARBON AND ALLOY STEELS FOR OVER HALF-A-CENTURY

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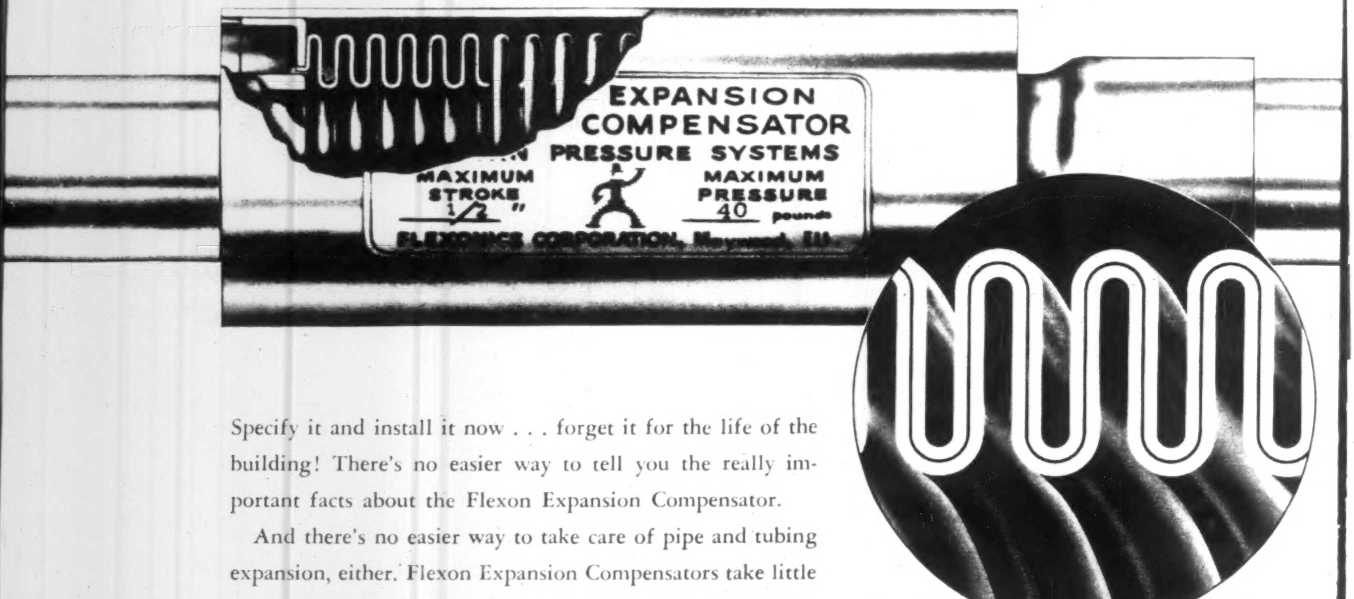
Flexon®

PACKLESS EXPANSION COMPENSATOR

the no-maintenance way to take up expansion in heating lines


EXPANSION
COMPENSATOR
PRESSURE SYSTEMS
MAXIMUM STROKE 1/2"
MAXIMUM PRESSURE 40 pounds
FLEXONICS CORPORATION, Maywood, Ill.

Specify it and install it now . . . forget it for the life of the building! There's no easier way to tell you the really important facts about the Flexon Expansion Compensator.

And there's no easier way to take care of pipe and tubing expansion, either. Flexon Expansion Compensators take little more space than the pipe or tubing that they replace. A mechanic can install one in minutes. Thousands of installations have proved them.

Standardize on this simple specification: Flexon Expansion Compensators for horizontal and vertical lines – Model L for low pressures – Model H for higher pressures. Write today for design and cost data.

The inside story

CONSTRUCTION

The bellows is fabricated from two plies of specially-rolled metal to combine strength with flexibility. Bronze bellows for Model L; stainless steel for Model H.

Flexonics corporation

EXPANSION JOINT DIVISION • 1391 S. THIRD AVENUE, MAYWOOD, ILLINOIS

EXPANSION JOINTS · METAL HOSE · NON-METALLIC HOSE · BELLOWS · AIRCRAFT COMPONENTS

WE'RE *Mighty Proud* OF YOUNGSTOWN'S DISTRIBUTORS

Youngstown Distributors are in business for only one reason—to quickly supply what you want, when you want it, and in the quantity you require. They provide you the highest quality Youngstown Pipe at the right price—by coordinating their distribution with our mill production. Yes, our hat's really off to these valuable around-the-clock suppliers for the important function they daily perform to industry.

It will pay you to know and use your Youngstown Distributor because his:

- Large stocks are immediately available which allows a reduction in your inventory.
- Single source of supply will simplify and speed up your purchasing, receiving and bookkeeping.
- Service is available around-the-clock, 365 days a year.
- Salesmen can offer valuable information on products and processes because they are constantly in touch with leading industrial plants.

Your Youngstown Distributor is as near as your telephone—why not call him today?

Specify Youngstown and secure these
7 Points of uniform goodness

uniform ductility	uniform wall thickness and size
uniform lengths	uniform strength and toughness
uniform threading	
uniform weldability	

uniform roundness and straightness

THE *Youngstown* SHEET AND TUBE COMPANY

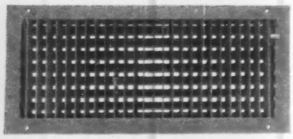
General Offices - Youngstown 1, Ohio
District Sales Offices in Principal Cities

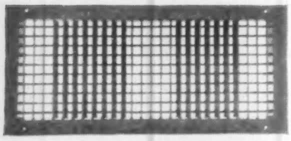
QUALITY YOUNGSTOWN SERVICE

YOUNGSTOWN PIPE

PRODUCERS OF QUALITY CARBON AND ALLOY STEELS FOR OVER HALF-A-CENTURY

. . . a hard, silver-blue, baked, deluxe finish over prime coat — a quality finish for a quality product — — and job-painting is eliminated.


STYLE DVL


STYLE DDV

And — do you know that —

STEWART outlets provide the industry's maximum free area —

All STEWART register faces are available with Opposed - Action Valves or 1" Parallel - Acting Multivalves at a lower price.

Most STEWART products are available in Stainless Steel — Solid Bronze — All Aluminum.

An inquiry on your letterhead will receive the prompt, courteous attention of a representative.

Stewart MANUFACTURING COMPANY, INC.

CEDAR GROVE ESSEX COUNTY NEW JERSEY

3426

How owners feel about an all-copper installation

Relaxed and reassured—that's the way owners of property feel about all-copper installations you do for them with Hussey Copper. Wherever you must guarantee lasting satisfaction, quality appearance and high efficiency for a lifetime—use the lifetime metal—Hussey Quality Copper. Hussey Copper is produced under quality controlled conditions from mine to finished product. To build a long list of contented customers—make sure it's Hussey Copper—and be sure!

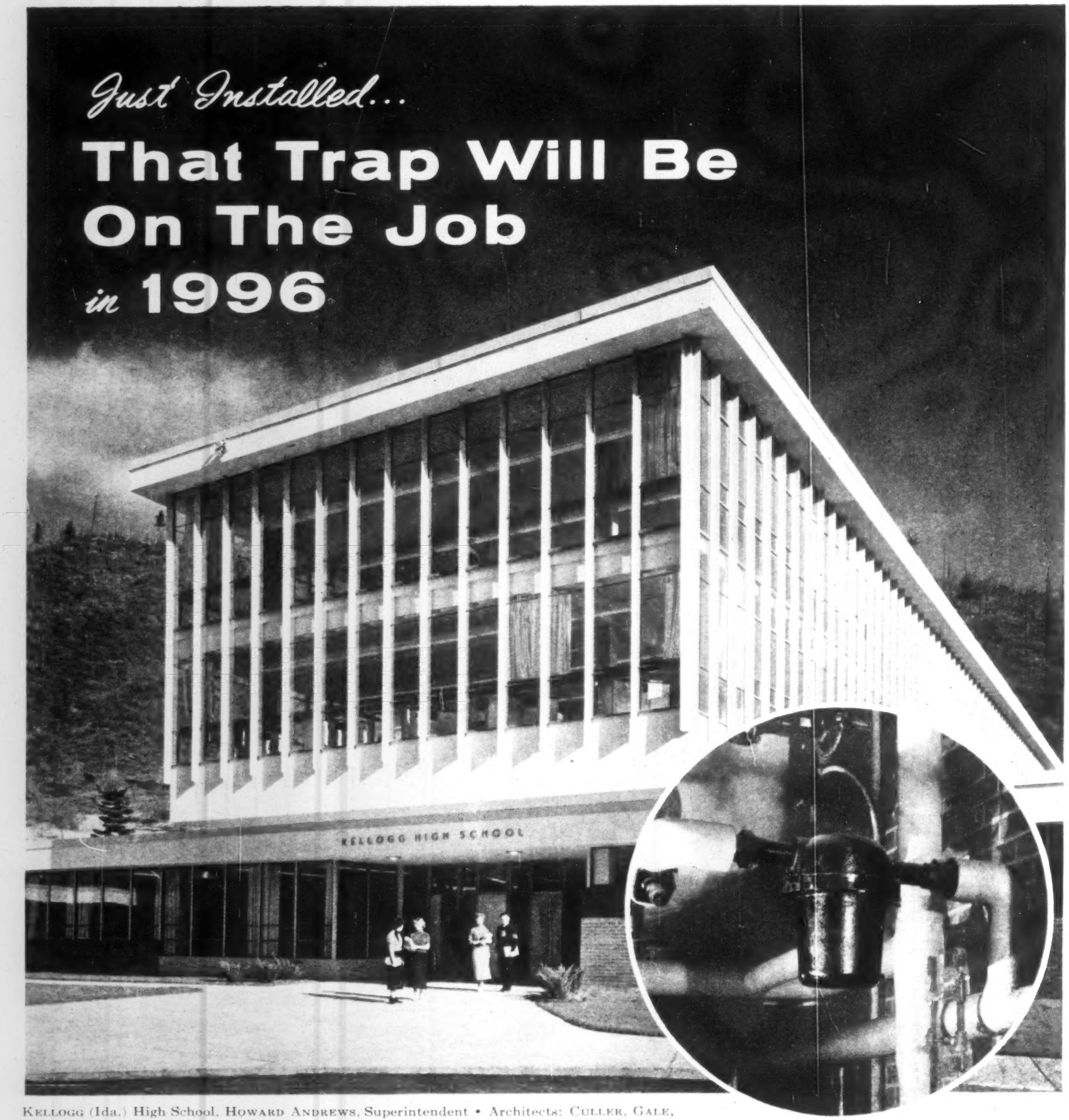
C. G. HUSSEY & COMPANY
(Division of Copper Range Co.)
ROLLING MILLS and GENERAL OFFICES: PITTSBURGH 19, PA.

HUSSEY
COPPER PRODUCTS
SHEET
WIRE • COILS
ROD • STRIP
TUBING
ROOFING PRODUCTS

Since 1848
HUSSEY
COPPER · BRASS

7 Convenient Warehouses to serve you

PITTSBURGH (19) 2850 Second Ave.
CLEVELAND (3) 5318 St. Clair Ave.
CINCINNATI (37) 1045 Meta Drive
CHICAGO (18) 3900 N. Elston Ave.
ST. LOUIS (1) Central Terminal Bldg.
PHILADELPHIA (30) 1632 Fairmount Ave.
NEW YORK, LONG ISLAND CITY (6) 34-39 Thirty-first St.



KELLOGG (Ida.) High School, HOWARD ANDREWS, Superintendent • Architects: CULLER, GALE, MARTELL & NORRIE, Spokane, Wash., PERKINS & WILL, Chicago & White Plains, N. Y.
LYLE E. MARQUE & ASSOC., Mechanical Engineers

Brand new building, brand new Illinois heating specialty system . . . and they'll *both* be doing a smooth, efficient job 40 years from now, probably even longer.

The new high school at Kellogg, Idaho, was designed for the future—and so are its Illinois Engineering Float and Thermostatic traps (above), Strainers and Thermostatic traps. Kellogg High can count on more years of trouble-free service from Illinois than you'd ever expect from a steam trap . . . and there'll be few maintenance problems with Illinois traps' simple, solid design.

Specify a trap you can install and forget about for 40 years. Select from a full line of Thermostatic Traps, Float and Thermostatic Traps and Steam Traps. Traps range from 25 inches vacuum to 600 lbs. pressure in capacity. Write for Bulletin 110 now.

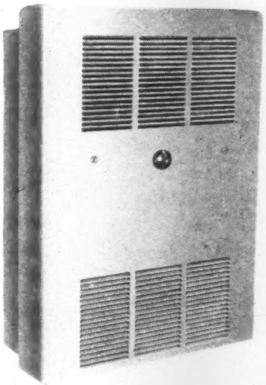
illinois
ENGINEERING

Illinois Engineering Company
2017 S. Racine Ave., Chicago 8, Ill.
DIVISION OF AMERICAN AIR FILTER COMPANY, INC.
Heating Specialties • Power Specialties • Control Systems

QUALITY
has no substitute

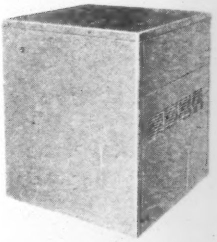
Use **KRITZER**

heating and cooling equipment for profit and top performance

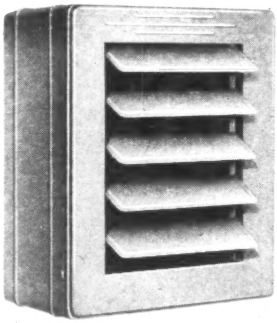


DUAL-VECTOR®

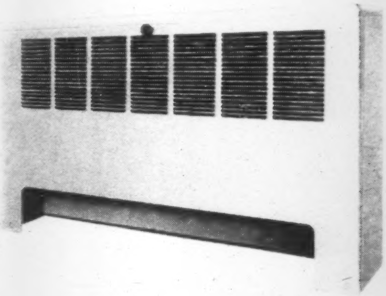
Low cost, combination heating and cooling units for residences, apartments and motels. Two models fit between studding. Easy installation. Clean, filtered air both summer and winter. Insulated enclosures prevent condensation. Individual room control optional. Free-standing types for remodeling.



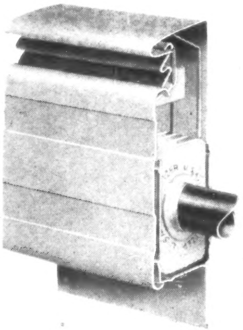
HYDRO-PAC® WATER CHILLERS Completely packaged. Factory tested. Ready for easy field installation. Fine "furniture" steel cabinets with baked enamel finish. Five year warranty on hermetic system.



UNIT HEATERS Horizontal and vertical discharge, propeller fan types. Wide selection of sizes for steam and hot water. Die formed cabinets of heavy gauge steel. Baked-on, gray hammer enamel finish. Rubber mounted motors. Dynamically balanced fans in deep drawn venturi for quiet operation.

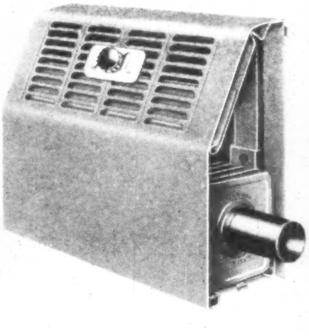


CONVECTOR-RADIATORS Floor, wall hung and recessed models. Famous KRITZER coil construction for steam and hot water. Bronze headers. Heavy, reinforced steel cabinets. Full range of sizes. Chain or knob operated dampers. Cabinets phosphatized. Gray prime, baked-on finish.



K LINE RADIANT BASEBOARD

Clean, modern lines. Quiet. Easy to install. For homes, apartments, offices



STB RADIANT BASEBOARD

For hard-to-heat areas. Large heating capacity. Safe, rounded corners and edges.

TYPE "R" AIR BASE WARM AIR BASEBOARD

Adds beauty to any home. Efficient warm air heating or cooling. Two and four foot lengths. Built to last.

ASK YOUR JOBBER FOR KRITZER PRODUCTS

"IF IT'S KRITZER, IT'S RIGHT, SIR!"

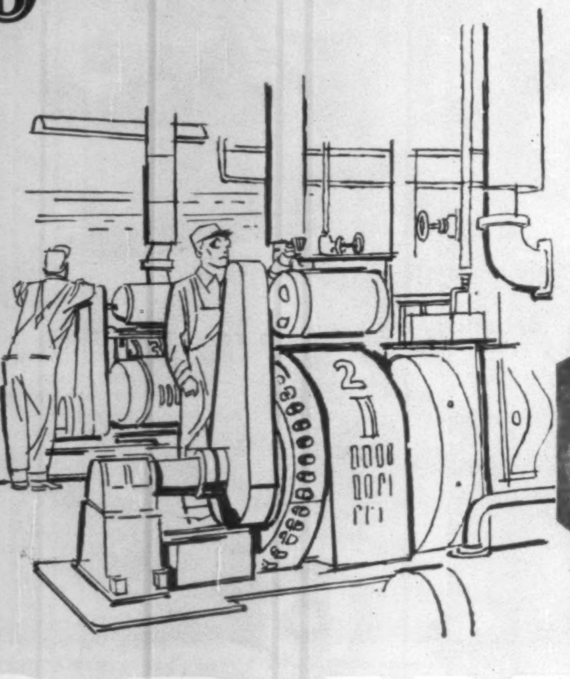
KRITZER

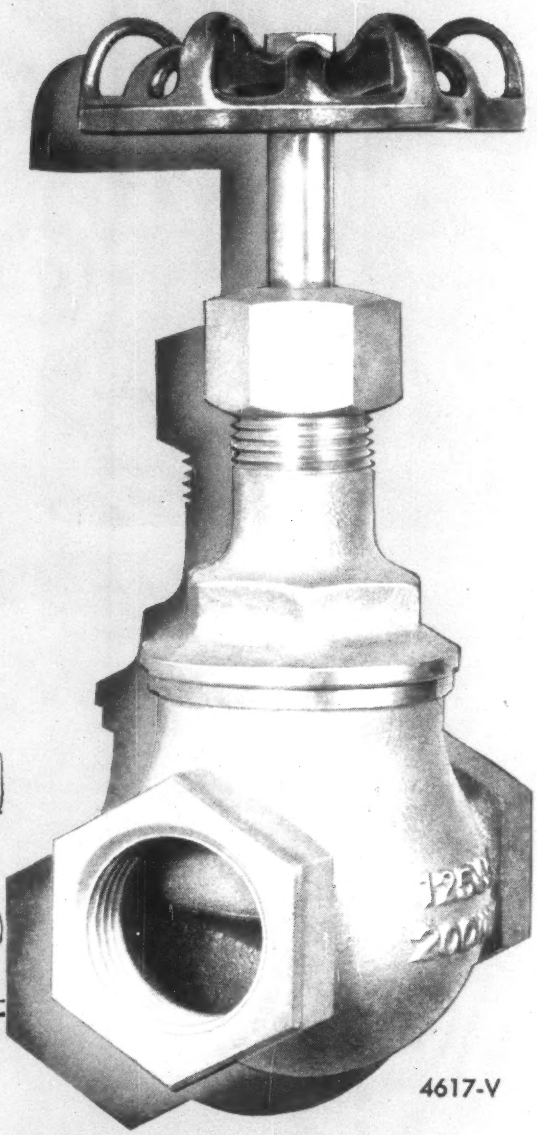
KRITZER RADIANT COILS, INC.
2901 Lawrence Ave. • Chicago 25

WHY BUY MORE VALVE THAN YOU NEED?

Some valve users apparently believe that quality bronze valves aren't available at ratings below 150-pounds steam pressure. Consequently, they buy heavier valves where 125-pound and even 100-pound valves would do the job, with complete safety. This is needless expense because Ohio Brass valves, with the quality features of higher pressure valves, are available at both 125-pounds and 100-pounds steam pressure. Ask your distributor about them.

OHIO BRASS MANSFIELD OHIO, U. S. A.



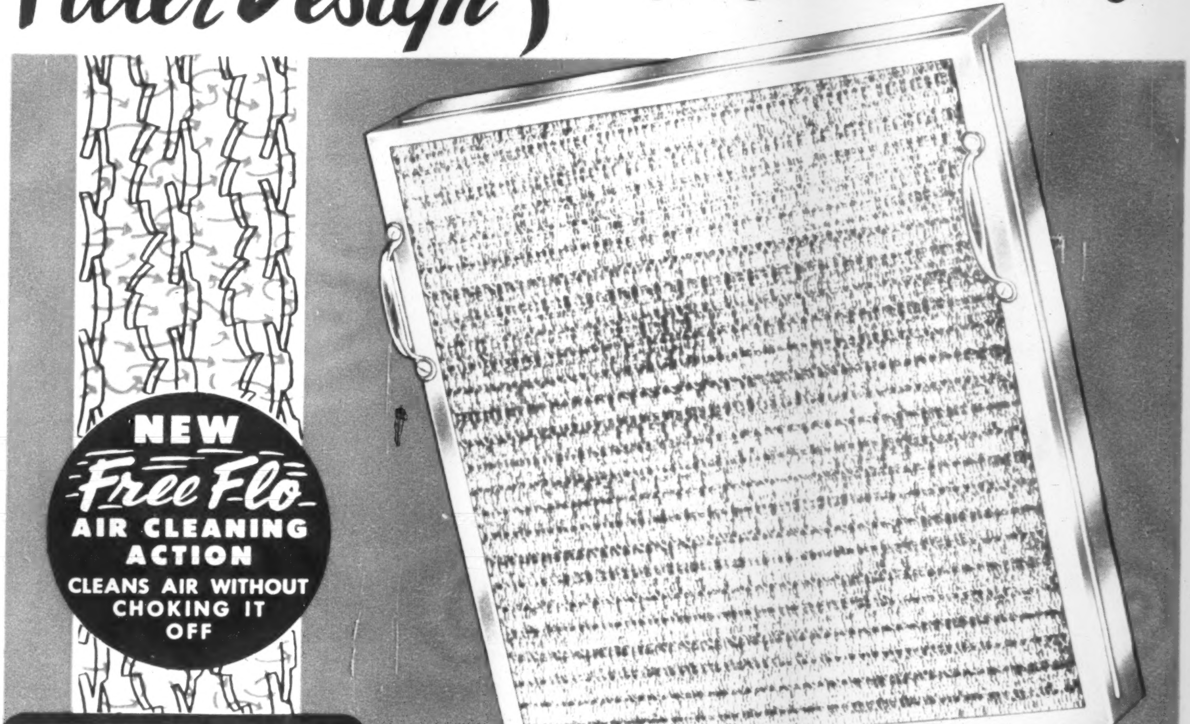


4617-V

O-B VALV

NEW
Filter Design

29% SLOWER RESISTANCE RISE
. . . per gram of dirt caught


NEW
Free Flo
AIR CLEANING ACTION
CLEANS AIR WITHOUT CHOKING IT OFF

Evans *Lifelong* Air Filters

Super cleans the air . . . yet maintains FULL FLOW AIR DELIVERY

As filter loads, rate of static pressure rise is low and slow. Low resistance permits faster release of cooled air from cooling coils. Thus blower delivers at peak efficiency all during cooling cycle. No sudden jump . . . no sharp vertical rise in resistance. Air delivery system remains in balance. Resistance rise is slow even from 0.50" water gauge to 1.00" or 1.50" water gauge. High lint (or fibrous material) content in the air does not change this performance.

BIG CAPACITY DESIGN

Enables Evans filter to catch and hold lint without choking off air stream (particularly desirable in super markets, department stores, hospital, textile plants, and so forth where there is high lint content in the air).

EXTRA HEAVY LIFETIME CONSTRUCTION

All aluminum (heavy gauge). Every part precision made—precision assembled.

SEE OUR EXHIBIT AT THE INTERNATIONAL
HEATING AND AIR CONDITIONING EXPOSITION
Booth 333-335 Chicago, Ill. Feb. 25—March 1

SAVE 50% ON CLEAN AIR MAINTENANCE COSTS

One set of Evans filters last the life of the air handling system. No messy high-tension adhesive oil. Evans fluid has *built-in* detergent to help clean filters. Hose out with ordinary tap water. Light-weight, extra easy to handle.

MAIL COUPON FOR FREE LITERATURE

THE GEORGE EVANS CORP. • Moline, Illinois

Gentlemen: Rush me full details on the NEW HIGH CAPACITY EVANS FILTER that has a 29% slower static pressure rise per gram of dirt caught.

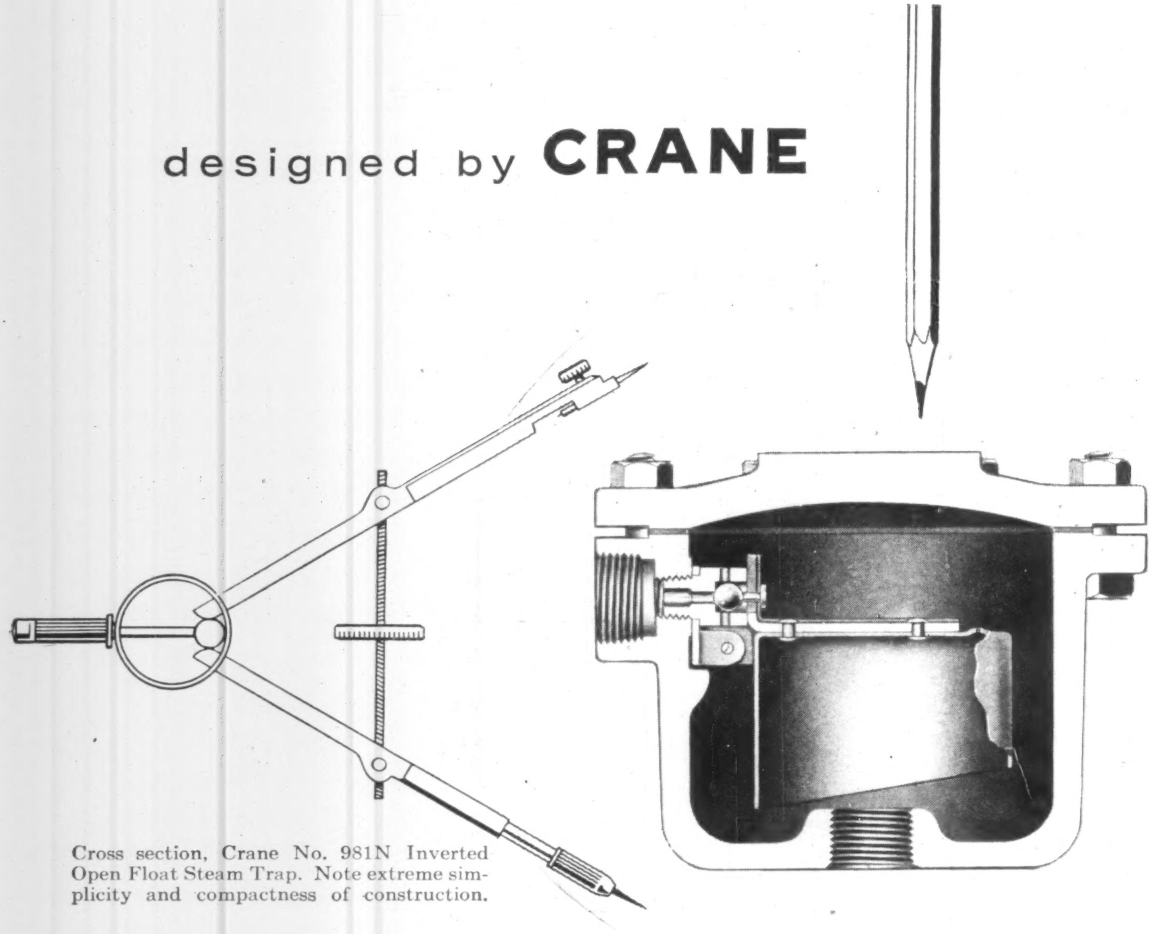
NAME ____________________

COMPANY ____________________

ADDRESS ____________________

CITY ____________ STATE ____________

designed by CRANE



Cross section, Crane No. 981N Inverted Open Float Steam Trap. Note extreme simplicity and compactness of construction.

to keep your steam lines

HOT, DRY and EFFICIENT

With an apparatus heated or operated by steam, you'll save fuel and insure operating efficiency by installing Crane Inverted Open Float Steam Traps—designed to drain condensate accumulation automatically and instantly.

The exceptionally rugged, simple construction of Crane Steam Traps provides high discharge capacities in relation to their size—permitting more compact installations. They are available in working pressures from 1 to 300 pounds saturated steam, sizes ½ to 1 inch.

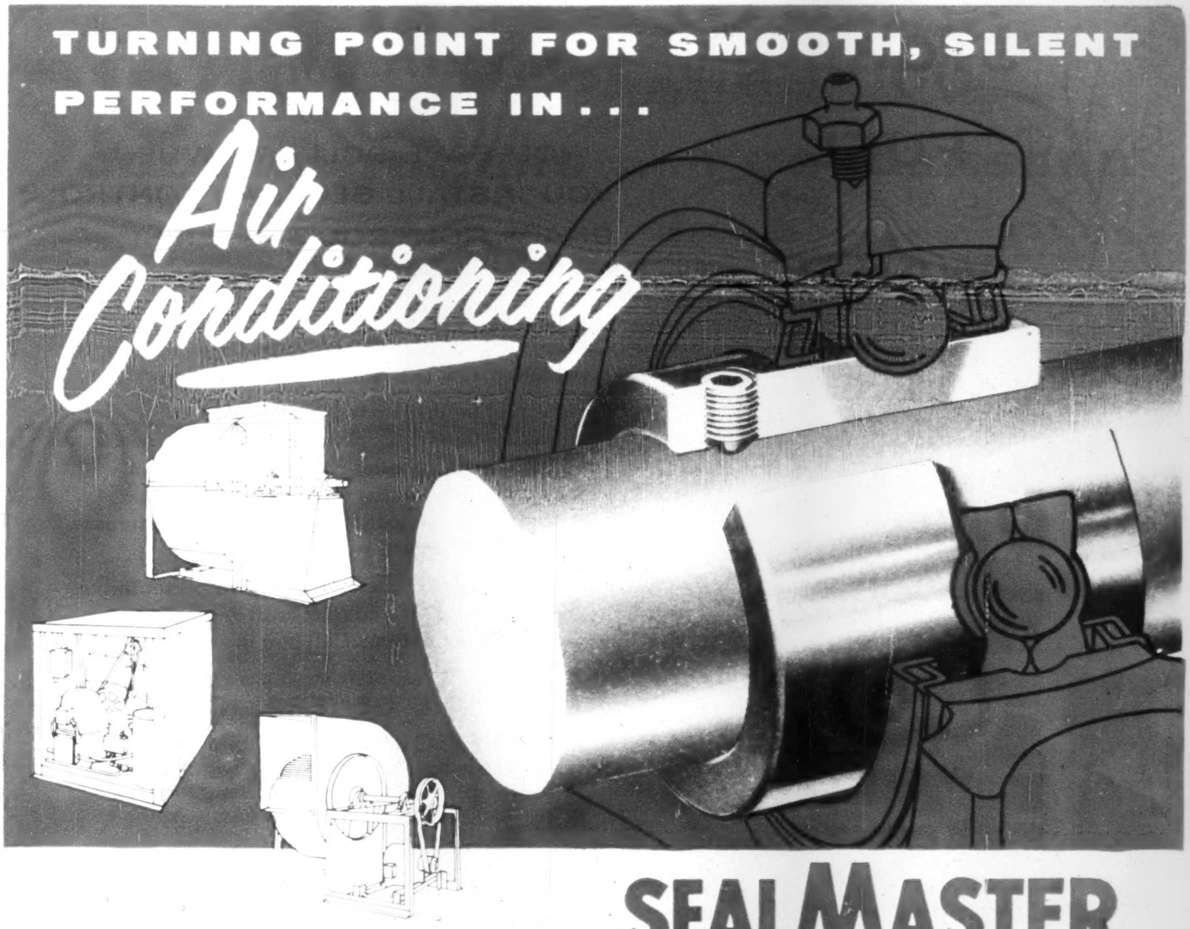
For literature giving ordering and installation instructions, see your Crane Representative or write to address below.

CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

TURNING POINT FOR SMOOTH, SILENT PERFORMANCE IN . . . Air Conditioning



SEALMASTER

BALL BEARING UNITS

RUBBER MOUNTED CARTRIDGE

RUBBER MOUNTED FLANGE

RUBBER MOUNTED PILLOW BLOCK

SEALMASTER

BALL BEARING UNITS

PILLOW BLOCK

TWO-BOLT FLANGE

FOUR-BOLT FLANGE

Smoother, quieter performance is the aim of every air conditioning manufacturer. SEALMASTER Ball Bearing Units with their exclusive combination of features are a major step in achievement of that goal. There's no surer way of adding quality and smooth, quiet performance to the air conditioning equipment you manufacture. The key to SEALMASTER'S added quality and performance are found in this exclusive combination of features.

- **ZONE HARDENING** assures positive race to shaft holding power, minimizing vibration, eliminating shaft wear and reducing fretting corrosion.
- **LAND RIDING BALL RETAINER** traps grease and prevents "churning"
- **LABYRINTH SEAL** keeps dust and dirt out, lubrication in
- **LOCKING PIN AND PERIMETER DIMPLE** prevents creep or spin of outer race ring in housing, eliminating housing wear, but permitting alignment of shaft and bearing unit.

Write for full information on these features and Bulletin 454.

SEALMASTER BEARINGS A DIVISION OF STEPHENS-ADAMSON MFG. CO. • 47 RIDGEWAY AVE., AURORA, ILLINOIS

STOP FUEL WASTE

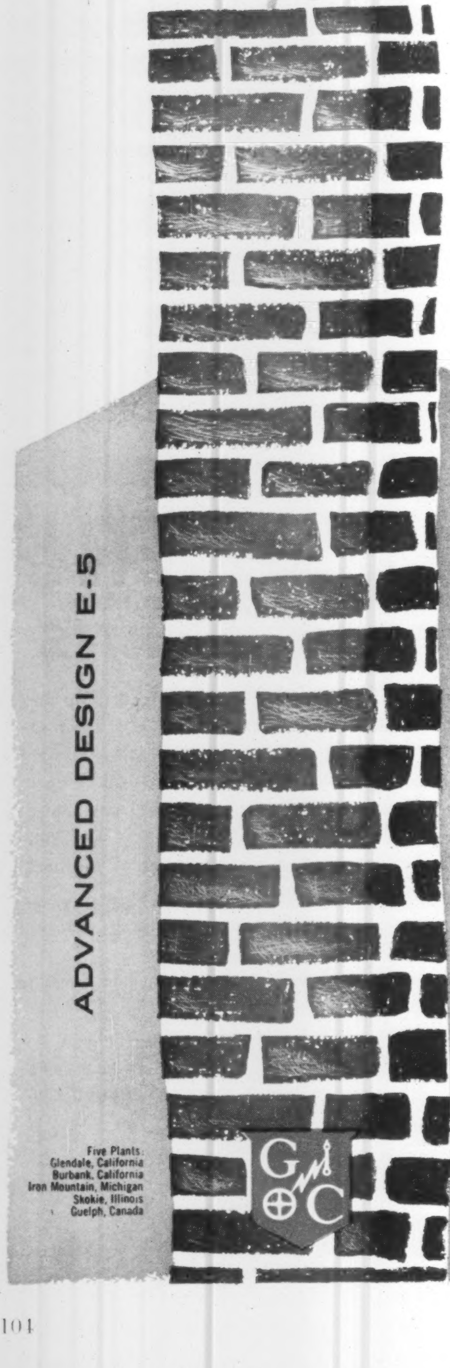
...YOU SAVE DOLLARS WHEN YOU INSTALL GENERAL CONTROLS DRAFT CONTROL SYSTEMS!

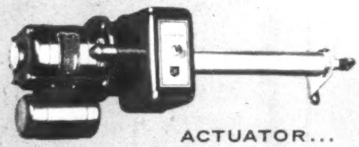
You stop fuel waste when you install the new General Controls E-5 Draft Control System. You save money with any type boiler . . . any type fuel!

Besides fuel savings up to 25% . . . automatic draft regulation helps you save manpower as well. Even in a one-man boiler room the savings can exceed a thousand dollars in one year! Another benefit: in addition to *money savings* you'll *increase good will by adequate smoke control.*

Ask the General Controls Factory Representative in your area to show you how draft regulation will benefit your installation. Call him in soon.

THIS IS THE GENERAL CONTROLS DRAFT REGULATION SYSTEM...



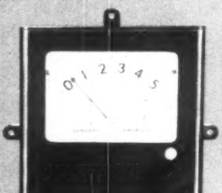


ACTUATOR...

Responding to the commands of the Draft-Program Control, this unit positions uptake damper. Maintains correct draft conditions continuously without attention.

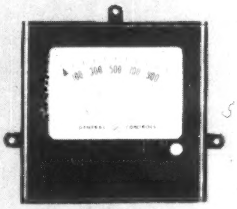
DRAFT-PROGRAM CONTROL...

Master unit programs damper action for start-up and shut-down, plus setting correct damper position for any firing rate. Optionally, it will provide Low Draft Cut-off, Time Delay Cut-off, Adjustable Starting Draft . . . it not only acts fast . . . it's accurate! It even senses changes in atmospheric conditions!



DRAFT GAGE...

Instrument gives continuous visual reading of draft conditions. Operator always knows what is going on . . . no guesswork!



TEMPERATURE GAGE...

Flue gas pyrometer instrument shows efficiency of boiler . . . warns operator of wasteful firebox conditions!

Five Plants:
Glendale, California
Burbank, California
Iron Mountain, Michigan
Skokie, Illinois
Guelph, Canada

WRITE FOR 1957 CATALOG

GENERAL CONTROLS

America's Finest Automatic Controls for Home, Industry, and the Military

Factory Branch Offices Serving *All* Principal Cities of the United States and Canada

HM THE ONLY Matched

COOLING TOWERS and CONDENSERS

The Halstead & Mitchell Cooling Towers you select are *matched* by design to work with the famous Halstead & Mitchell water-cooled Condensers. You need no longer buy a high-efficiency cooling tower to work with a low-efficiency condenser (or *vice-versa*) . . . a long-life cooling tower to work with a short-life condenser (or *vice-versa*).

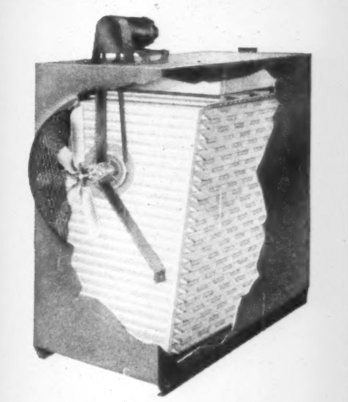
Remember that every cooling tower you sell is planned to work with a water-cooled condenser—then you'll see why America's leading manufacturers of air-conditioning and refrigeration equipment have swung to Halstead & Mitchell for their original equipment needs in both these components. With cleanability you'll sell more. Why sell less?

20-Year Guarantee!

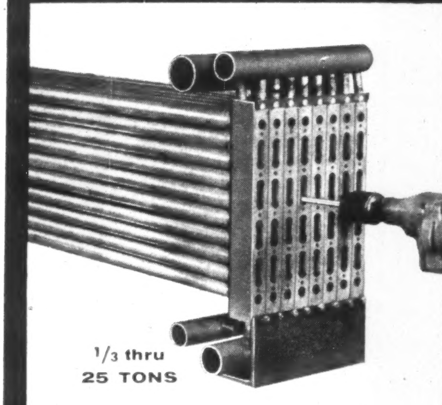
on the wetted deck surface against rotting or fungus attack

Only Halstead & Mitchell pressure-creosoting can provide a *guarantee* against immediate attack by fungus and marine parasites . . . or chemical deterioration from acids in water.

Added to this H&M exclusive are other major advantages. There's ultra-high efficiency in the gravity-type water distributing pan which eliminates extra pumping head required on spray type towers . . . and cuts down on water losses due to "atomizing" of water. And there's extra-long life in stainless steel fans . . . and sheet steel cabinets hydraulically painted with vinsynite, vinyl zinc and chlorinated rubber.



2 thru 120 TONS



1/3 thru 25 TONS

Lifetime Cleanability

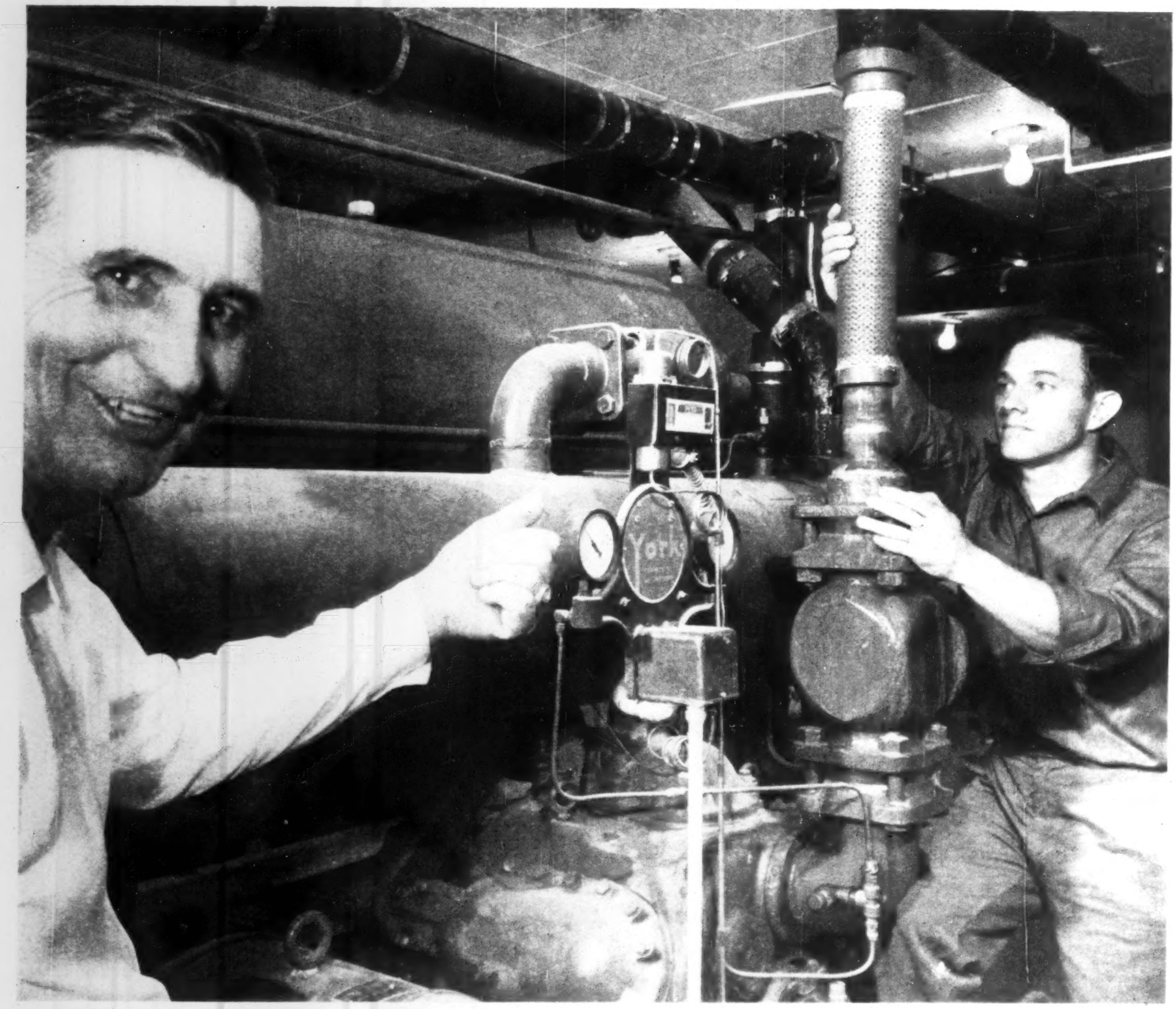
The *mechanical* cleaning of H&M double-tube, counter-flow condensers means the simplest, least dangerous method of restoring new unit efficiency. Whether removing a heavy coating of sludge and scale, or a thin insulating film on the inner walls of the copper tubing, the mechanical cleaning tool restores heat transfer efficiency in a matter of minutes. The result is lowered discharge pressures . . . more heat carried off by cooling water . . . lower bills. *Only* the impurities are removed . . . the thickness of the copper wall remains intact, and the condenser gives extra years of peak service.

At Leading Heating and
Refrigeration Wholesalers
EVERYWHERE

Write for Detailed Specifications

HM
Halstead & Mitchell

BESSEMER BUILDING • PITTSBURGH 22, PA.


CO-OWNER TOM STOUGH and service representative of Southern Air Conditioning and Refrigeration Co. point out 45-ton hot and cold water air conditioner, installed with 2⅝" and 1⅛" American VE's at Velda Rose Motel, Hot Springs, Ark.

"Bar costly return service calls with American Vibration Eliminators"

recommends Tom Stough, Co-owner, Southern Air Conditioning and Refrigeration Co., Hot Springs, Ark.

"Since we first began installing American VE's on our jobs four years ago, we have never had a service call . . . never had a gas loss traceable to malfunctioning of the Vibration Eliminators.

"Take the Velda Rose Motel here in Hot Springs, for example. We installed 45-ton and 24-ton systems protected by 2⅝" and 1⅛" American VE's, 2½ years ago . . . and there has not been one iota of damage due to vibration. No noise, either, to bother guests!"

You can use American VE's with confidence because—

The right metal does the job. The special tin-bronze alloy—the result of American Brass metallurgical know-how—is tailored for the refrigeration and air conditioning industries.

Double braid where extra protection is needed. On all American VE's 2⅝" or larger.

Clean, dry, tested, protected. Snip the end of the vaporproof polyethylene bag and you have a factory-fresh unit to install . . . clean, inside and out!

Packaged for your convenience, protection. The new boxes are sturdy, easy to open, easy to identify. Insist on VE's with the stamping "American" on the ferrule . . . an Anaconda product.

NOW listed by Underwriters' Laboratories through sizes 3⅜" O.D.

For descriptive folder write: The American Brass Co., American Metal Hose Division, Waterbury 20, Conn. In Canada: The Canadian Fairbanks-Morse Co., Ltd. 56210

WHEREVER CONNECTORS MUST MOVE

AMERICAN

For American Vibration Eliminators see your

ANACONDA®

DISTRIBUTOR

Does the guy still use an "Ice Box"?

Yes, it's a foolish question, but the fact remains that lots of people were still hanging out the ice card when this fellow's boiler was equipped with a McDonnell Boiler Feeder.

How do we know? Because we have an order from a contractor for repair parts to keep his 1930 feeder alive and on the job!

Think it over: In 1931 the mechanical refrigerator was just beginning to make a slight dent. Chances are this fellow bought one about that time and has worn out two or three more since . . . Yet he expects his old 1931 feeder to give him up-to-date service and protection.

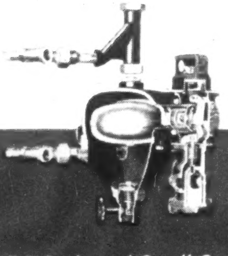
Does this mean that refrigeration has stepped ahead faster than heating? Not by a jugfull. It simply means that the heating industry has lagged behind in declaring its wares!

Take a lesson from the folks who sell refrigerators, autos, ranges and the like. There are people in your locality who need, not only a new boiler feeder, but a whole new heating plant. You're the well established expert they rely on to show them what they need. Next time you're called in to fix up an old heating set-up show them that . . .

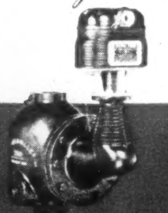
the best way to fix is to REPLACE!

McDonnell & Miller, *Inc.* 3500 N. Spaulding Ave., Chicago 18, Ill.

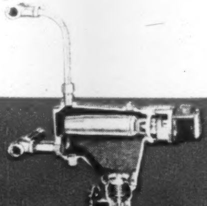
Doing One M&M SAFETY CONTROLS *Thing Well*



No. 47-2 *Feeder and Cut-off Combination* — for most automatically fired heating boilers operating at pressures up to 25 psi. Other types for larger boilers, higher pressures.



No. 92 *Pump Control, Cut-off and Alarm Switch* — for boilers up to 250 psi. Also available with integral water column (No. 192), and for 150 psi. service (91 Series).



No. 67 *Low Water Cut-off* — for all steam boilers with pressures up to 20 psi. Other types for hot water heating boilers, higher operating pressures.

No. 230-M-1 *Pressure Relief Valve* — for large hot water space heating boilers. Meets ASME Code; btu.-rated by National Board. Other sizes for all needs.

McDONNELL *Boiler Water Level Controls and Safety Devices*

Your Jobber Stocks Them

VERTICAL MULTIZONE

THERMAL AIR CONDITIONING EQUIPMENT

- *ENGINEERED FOR MAXIMUM EFFICIENCY*
- *BUILT FOR LONG LIFE*

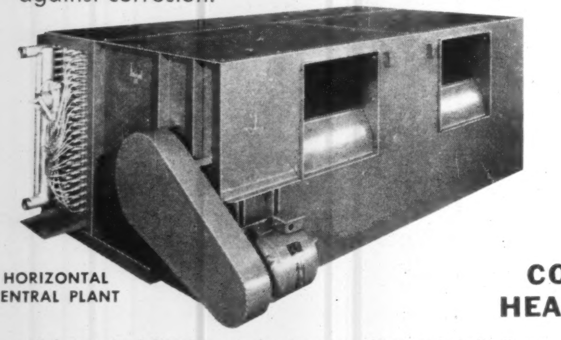
CENTRAL PLANT CONDITIONERS
16 Casing Sizes — 500 to 21,000 cfm

MULTIZONE CONDITIONERS
9 Casing Sizes — 1500 to 21,000 cfm

Both Horizontal and Vertical Types

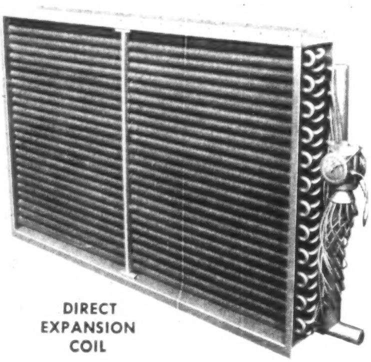
CHECK THESE DESIGN FEATURES THAT PUT A NEW HIGH IN PERFORMANCE

- Rugged sectional construction welded throughout.
- Cabinets fabricated of best quality, black, cold-rolled furniture steel bonderized and finished with baked-on enamel for strong protection against corrosion.
- Slide rails permit easy removal of coils for servicing.
- Fan sections rotatable to fit any discharge requirement.
- Vertically-mounted cooling coils in vertical units eliminate hold-up of condensate.
- Combination filter and mixing boxes for high or low velocity filters are available for all units.
- Central plant units obtainable with by-pass only, with internal face and internal by-pass, or internal face and external by-pass.



HORIZONTAL CENTRAL PLANT

THERMAL COOLING AND HEATING COILS



DIRECT EXPANSION COIL

- Fabricated of ⅝" OD seamless copper tubing with helically-wound aluminum or copper fins (coils with copper fins solder-coated after fabrication).
- Coil types are direct expansion, chilled water, hot water, standard steam, and non-freeze steam.
- Sporlan distributors and expansion valves are standard on direct-expansion coils.
- Suction headers for direct-expansion coils are Type L copper.
- Supply and return headers on non-freeze steam coils are Type L copper, with steel connecting nipples.
- Supply headers on water and standard steam coils are Schedule 40 black steel pipe (copper headers available at slightly higher price).
- Coil tube sheets and top and bottom channels are #16 U.S.S. gauge galvanized steel.
- All coils are tested at 400 psig air pressure, under water.
- Available 1 to 10 rows — cooling; 1 to 4 rows — hot water; 1 and 2 rows — steam.

FASTEST SHIPPING SCHEDULE

MANUFACTURERS REPRESENTATIVES: TERRITORIES AVAILABLE IN CERTAIN AREAS

THERMAL ENGINEERING CORPORATION

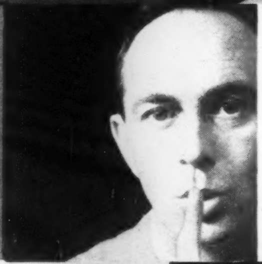
2605 W. Dallas
Houston, Texas

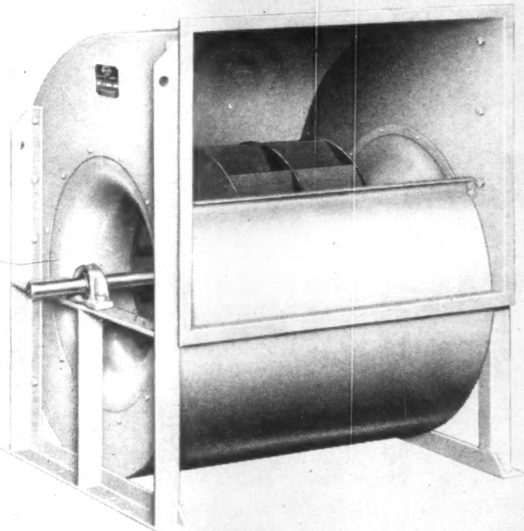
QUALITY PRODUCTS SINCE 1945

QUIET ON THE AIR!

TELEVISION CITY
CBS TELEVISION

When all sounds must be strictly "according to script,"
quiet operation of blowers is essential.
Most talked-about architectural project in its field,
CBS Television City, Los Angeles, depends on Utility Blowers
to insure noiseless, efficient performance.





BUILT, TESTED
AND RATED IN
ACCORDANCE WITH
A. S. H. V. E. AND
N. A. F. M. CODES.
SIZES 6" TO 60"

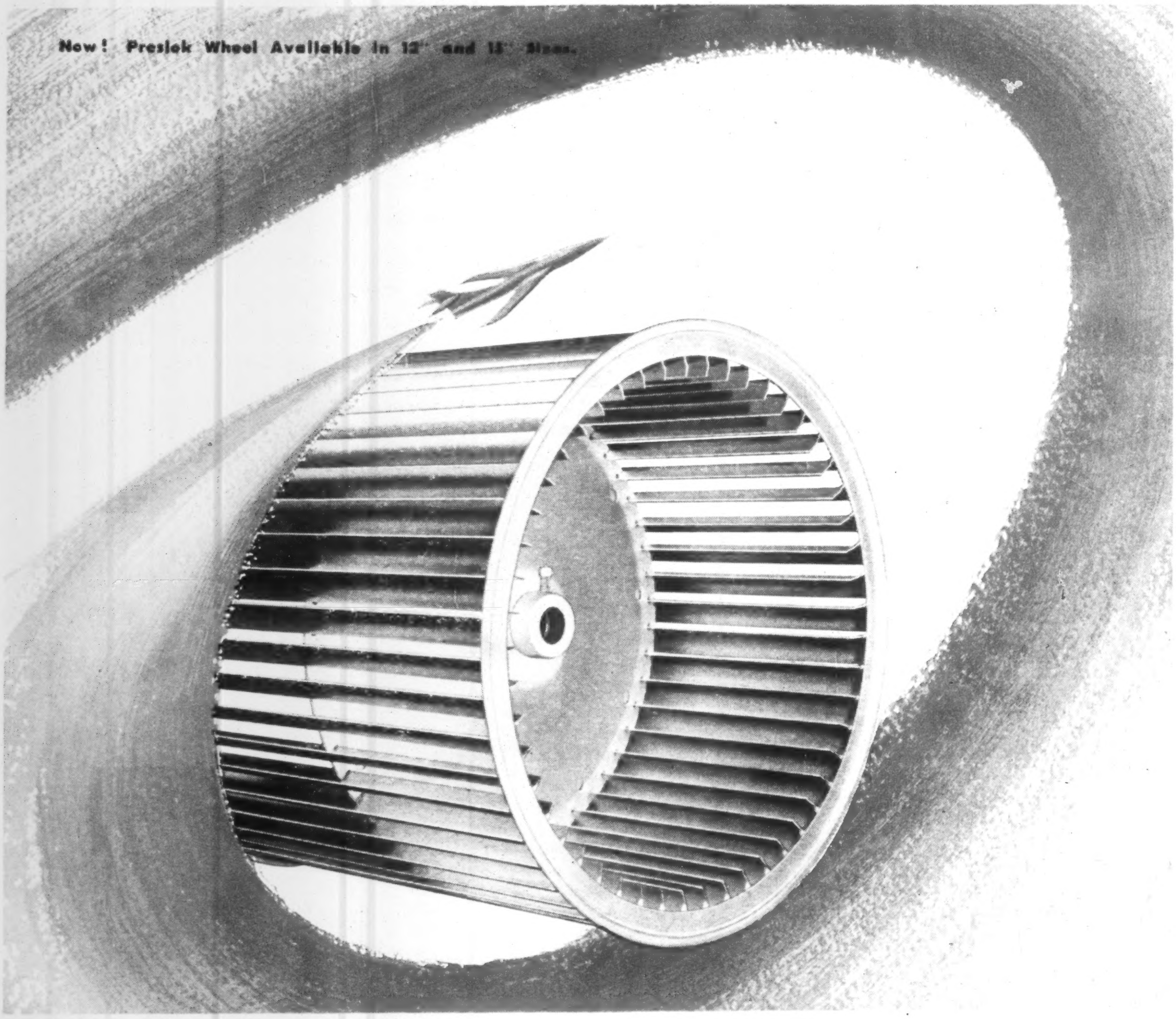
Manufacturers of heavy and standard duty blowers for heating, air conditioning and ventilating installations. Producers of blowers and blower parts for original equipment manufacturers. Write for catalogue data.

UTILITY FAN CORP.

911 EAST 59th STREET, LOS ANGELES 1, CALIFORNIA

A DIVISION OF UTILITY APPLIANCE CORP.

UTILITY
TRADE MARK



Now! Preslok Wheel Available in 12" and 15" Sizes.

GIVE YOURSELF A SPEED 'MARGIN OF SAFETY'

Specify Preslok® Wheel . . . Guarantees 50% More Operating Speed

Are your modern air conditioning requirements calling for greater speeds, higher statics? *Preslok is guaranteed to increase your operating speed maximums by at least 50%!*

With Preslok, the center disc grips the blade mechanically by an exclusive Lau locking method. Four disc fingers slip into the blade aperture and are pressed together in locking position. *Preslok eliminates ballooning at higher speeds . . . insures a quiet operation.*

See Us February 25 to March 1 at Booth 836, International Air Conditioning Exposition, Chicago, sponsored by ASH&AE.

One more advance for Lau engineering. One more answer to the needs of original equipment manufacturers, made possible by superior Lau engineering and production skills.

Perhaps your organization is confronted with a difficult air-moving problem right now. If so, why don't you call in Lau, who have pioneered so many advances in more than 25 years of service. Write Dept. M, today.

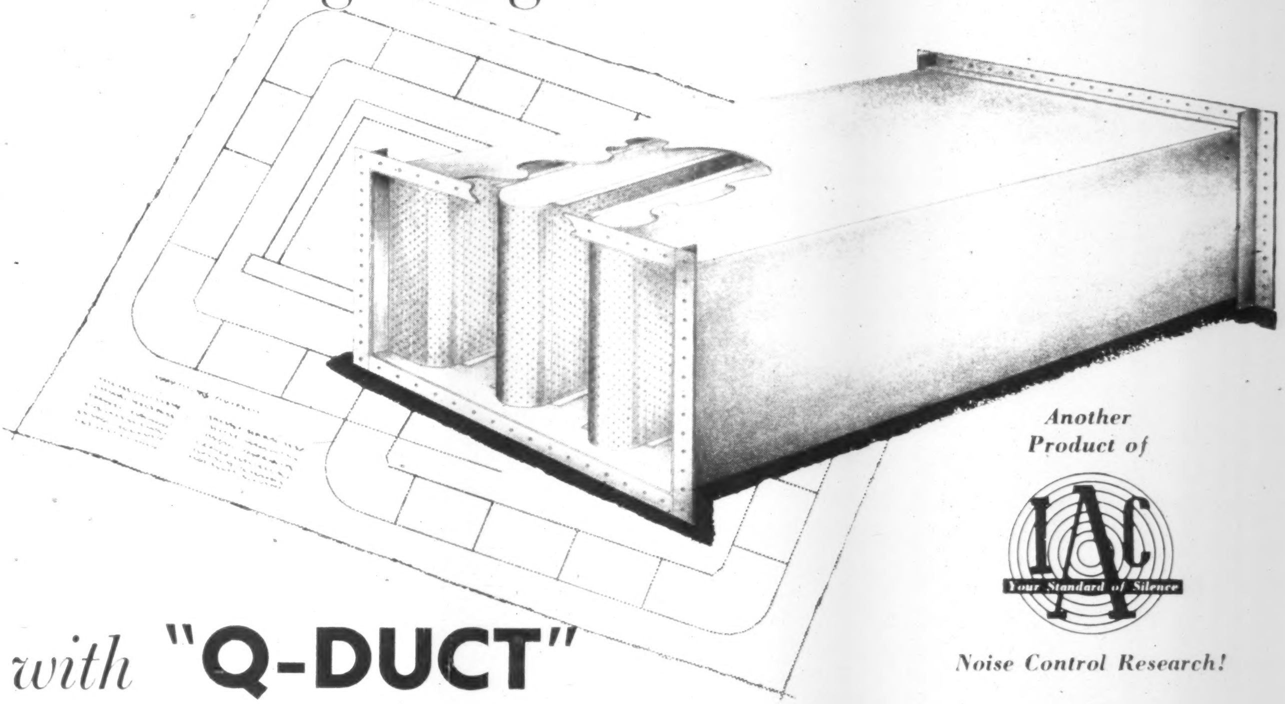
THE LAU BLOWER COMPANY
2007 Home Avenue, Dayton 7, Ohio
Azusa, California. In Canada: The Lau Blower Company of Canada, Ltd., Kitchener, Ontario

World's Largest Manufacturer of Air-Conditioning Blowers

I-57

NOW! AIR-CONDITIONING SYSTEMS SILENCED

in the Design Stage



Another Product of

IAC

Your Standard of Silence

Noise Control Research!

with **"Q-DUCT"**

PACKAGED STANDARDIZED SILENCING

Yes, the revolutionary, new "Q-DUCT" Air Conditioning Silencing System makes it possible for you to eliminate duct noises before any ventilating system is built or installed, or in existing systems. Through the use of handy "Q-DUCT" data sheets, you can determine the right prefabricated "Q-DUCT" unit to be fitted into the system during the design stage of the installation. Standardized "Q-DUCTS" are available in *148* sizes to meet every dimension and performance requirement!

Valuable territories available for qualified manufacturers' representatives.

PROVEN PERFORMANCE!

Determined from actual air-flow measurements "Q-DUCT" units measuring in length from 2 to 10 feet provide as much noise control as a conventional lined duct measuring from 30 to 100 feet long!

FREE DATA AVAILABLE!

Send coupon today for a complete set of "Q-DUCT" data sheets and catalog describing the "Q-DUCT" Silencing System!

INDUSTRIAL ACOUSTICS COMPANY, INC.
"Specialists in Noise & Pulsation Control — Mfrs. of Engineered Acoustical Products for Industry"
341 JACKSON AVENUE, NEW YORK 54, N. Y. • Tel: CYpress 2-0180

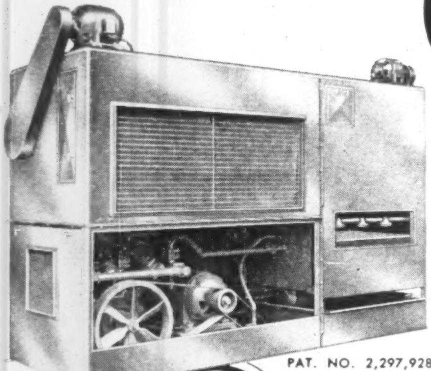
Industrial Acoustics Co., Inc.
341 Jackson Ave., New York 54, N. Y.

Please send catalog and full details of the "Q-DUCT" Silencing System.

Name..........
Firm Name..........
Address..........
City.......... Zone.......... State..........

If unusual loads or space requirements are your problem...

SPECIFY



PAT. NO. 2,297,928

GOVERNAIR

SCU

SELF CONTAINED UNITS

Governair, originators of completely packaged air conditioners, offers you the installation advantage of compact, all-in-one design *combined* with manufacturing flexibility that provides the answer to unusual space and load problems.

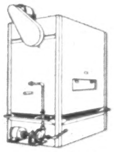
Governair's ability to please is further reflected in finer engineering and longer life construction. Write for full details on Governair SCU's!

READY TO OPERATE WITH SIMPLE ELECTRICAL, WATER AND DUCT CONNECTIONS

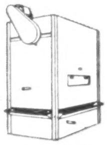
VISIT OUR BOOTH AT THE CHICAGO AIR CONDITIONING SHOW . .
— FEBRUARY 25th —
Booths N-306 & N-405

GOVERNAIR CORPORATION • 4840 North Sewell • Oklahoma City, Okla.

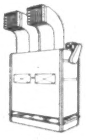
AIR CONDITIONERS



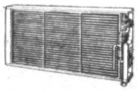
EVAPORATIVE CONDENSERS



COOLING TOWERS



UNIT COOLERS



BLAST COILS FOR HEATING AND COOLING

McDONALD *close-coupled centrifugal pumps . . .* Fully Bronze Fitted *to* Last Longer

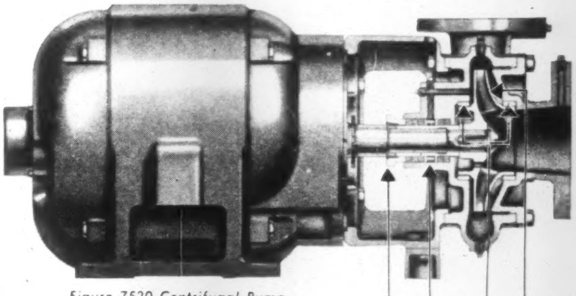


Figure 7520 Centrifugal Pump

BRONZE GLANDS

BRONZE SHAFT SLEEVES (HOOKED TYPE)

BRONZE CASE RINGS

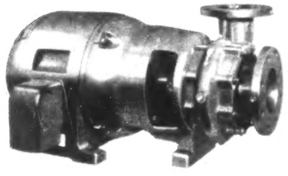
BRONZE IMPELLER

These dependable centrifugal pumps are good examples of McDonald quality construction. Impellers, case rings, shaft sleeves and glands are all carefully machined from durable bronze to give your customers extra years of trouble-free service.

You can be sure of top performance, too. The pump is mounted directly on the motor frame, and the impeller on the motor shaft to assure correct alignment under all conditions. The volute is ruggedly built and engineered for correct hydraulic relation. Design eliminates expensive foundations and requires minimum space. Close-coupled centrifugal pump motors are used exclusively.

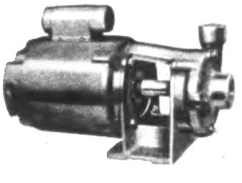
Give your customers extra years of efficient, dependable pump service. Specify McDonald Close-Coupled Centrifugal pumps. Send coupon for information and prices.

IDEALLY SUITED FOR AIR CONDITIONING APPLICATIONS, INDUSTRIAL AND IRRIGATION USES.



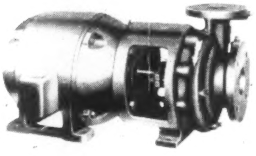
McDONALD FIGURE 7620

Moderate head centrifugal pumps, capacities to 280 G.P.M. Ideal operating range, 150 feet down to 50 feet T.D.H. Sizes 1¼", 1½" and 2" discharge; motors 1 to 10 H.P. 2 inch size flanged connections.



McDONALD FIGURE 7520

High head centrifugal pumps, capacities to 950 G.P.M. Ideal operating range, 280 feet down to 150 feet T.D.H. Sizes 1½" to 4" discharge; motors 2 to 60 H.P. Flanged connections.



McDONALD FIGURE 7720

Fractional H.P. centrifugals, capacities to 70 G.P.M. Total heads, 20 to 85 feet. Sizes ¾" discharge with ¼ or ⅓ H.P. motors; 1" discharge with ½, ¾ or 1 H.P. motors.

GENTLEMEN: Please send me information and prices on McDonald Centrifugal Pumps.

Name

Firm or Business Name

Address

City State

Over a century of dependable service

A. Y. McDONALD MFG. CO.

DUBUQUE, IOWA

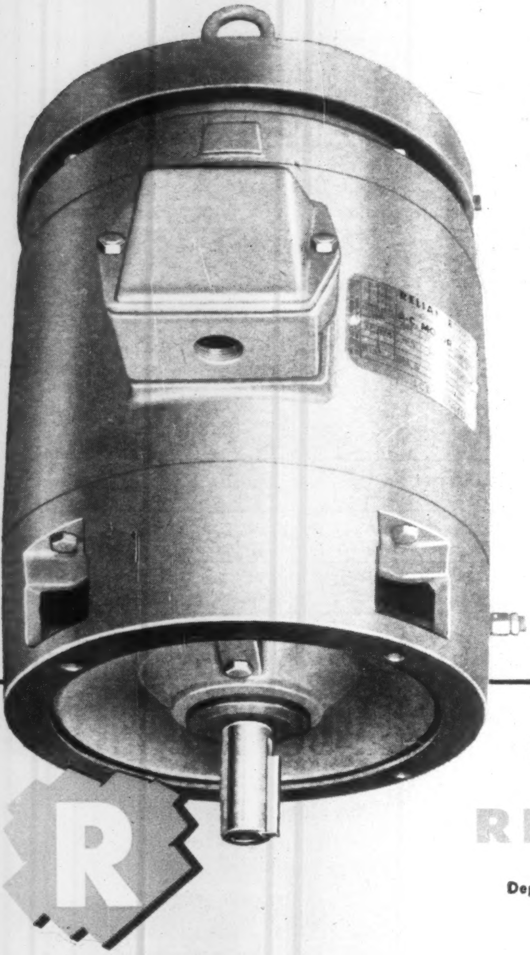
PUMPS • BRASS GOODS • OIL EQUIPMENT • DRAINS

EST. 1856 McDonald

NEW RELIANCE P-BASE MOTORS

Designed for outdoor and indoor installations

THESE RELIANCE FEATURES offer you the best motor for your pump installations.



Totally-Protected, weather tight construction—Corrosion-proof cast iron housing and sealed conduit box with threaded inlet locks out water, dust and foreign matter.

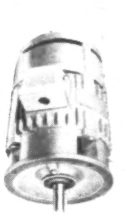
Perfect pump seating—True fit machined motor flange mates perfectly with pump flange, eliminating wear from misalignment.

Life long bearing protection—Special oversized thrust bearings designed for vertical operation are protected with Metermatic lubrication; you can't grease 'em wrong.

Shaft sealed—Neoprene shaft slinger protects windings from foreign matter creeping up the shaft.

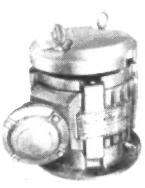
Enclosures for every application—Protected, totally-enclosed, and explosion-proof, Cl. I Gr. D, Cl. II Grs. E, F, & G enclosures available, 1-30 hp. all electrical characteristics.

B-1530



Totally-Enclosed, Corrosion-Proof

Protected

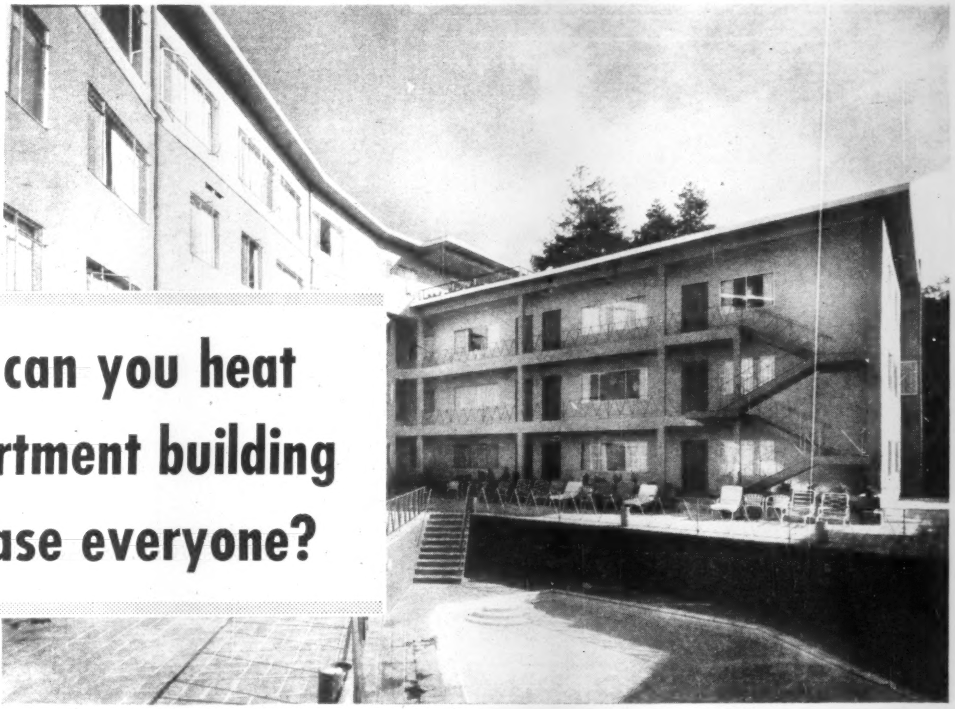


Explosion-Proof
Cl. I, Gr. D
Cl. II, Grs. E, F, & G

Write for bulletin B-2502 and check the facts on why Reliance Totally-Protected P-Base Motors are your best buy.

RELIANCE ELECTRIC AND ENGINEERING CO.

Dept. 361 A, Cleveland 10, Ohio • Canadian Division: Welland, Ontario
Sales Offices and Distributors in Principal Cities



How can you heat an apartment building to please everyone?

By letting each tenant select the temperature he likes in each room

IRON FIREMAN SelecTemp® HEATING

EVERY ROOM IS A SEPARATE HEATING ZONE with its own thermostat. Tenants can control the temperature according to their own preferences. The SelecTemp room heating unit automatically paces itself to supply just the right amount of heat needed. Unlike conventional "on-off" heating systems SelecTemp *modulates* from a slow "idling speed" up to full capacity. If one side of a building or home faces a cold wind while the other gets heat from the sun, the SelecTemp heating system automatically adjusts for this extra heat loss or gain *in each individual room.* In each SelecTemp unit the air is filtered, then heated by low pressure steam and circulated by a steam driven fan. There is no electric motor both fans and thermostats are non-electric.

FOR ALL TYPES OF BUILDINGS AND HOMES Iron Fireman SelecTemp heating is ideal for any type of building or home, new or old. From the largest apartment, hotel, office or institutional building to the smallest residence, Iron Fireman SelecTemp system gives the same responsive and dependable service. It's a new, yet thoroughly proved method of heating that sets new standards of comfort and economy.

LOW INSTALLATION AND OPERATING COSTS. The installation of Iron Fireman SelecTemp in new or old construction is economical and practical. Installation costs are low. Overheating is eliminated and many owners report substantial savings in fuel bills.

FOR COOLING. Individual unit cooling with SelecTemp heating makes the perfect twosome for year 'round comfort.

Send for free literature. If you plan to build or modernize a building or a home, you owe it to your client and yourself to investigate Iron Fireman SelecTemp before deciding on any heating system. Don't miss the opportunity to learn about this great modern engineering advance in heating . . . Iron Fireman SelecTemp. Mail the coupon below.

SelecTemp room unit indicated by arrow.

Lee Street Apartments, Oakland, California.

"The installation presented an engineering problem," says Mr. Gordon Peterson, General Contractor, "as the boiler room is located at the extreme end of the building, a distance of 420 feet from the last SelecTemp unit. The system's flexible operation, its ability to heat only the occupied rooms, as well as its immediate response, is commended by our tenants. We feel that the SelecTemp heating system is the finest that has been devised for apartments" . . . .

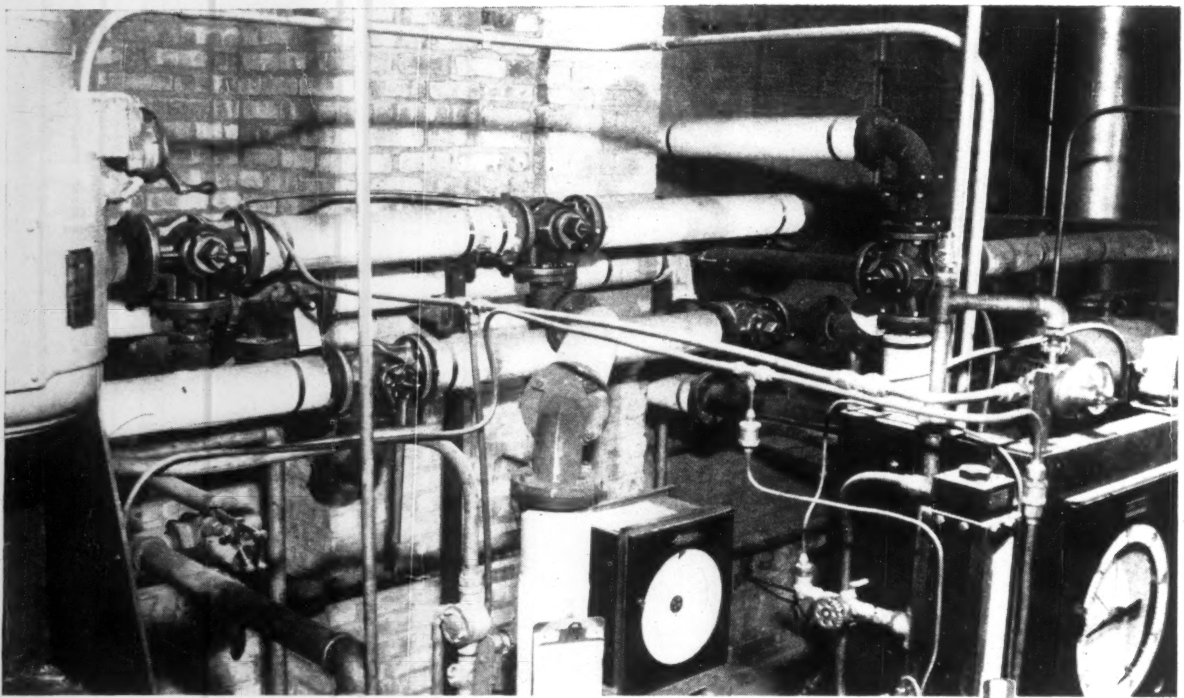
IRON FIREMAN®
Engineered
HEATING AND COOLING

MAIL COUPON FOR FREE INFORMATION

IRON FIREMAN MANUFACTURING CO.
3360 West 106th Street, Cleveland, Ohio.
(In Canada write to 80 Ward Street, Toronto)

☐ Send SelecTemp specifications and full information.
☐ Arrange for brief demonstration of SelecTemp room unit, in actual operation, in our office.

Name ______
Firm ______
Address ______
City ______ Zone ______ State ______



The T. F. Washburn Company uses . . .

HOMESTEAD *Lubricated* PLUG VALVES

ON LINES THAT

HANDLE HOT VARNISH AND RESIN BASE MATERIAL AT 500° F.

HOMESTEAD
200 OWG
150 SWP
PAT. PEND.

BECAUSE....

1. Previous Homestead Installations Gave Excellent Performance

2. Homestead Engineering Representative Rendered Fine Service on Installation Layout

Excellent performance of Homestead Lubricated Valves in the control of Jelled Paint Products at T. F. Washburn Company, is guaranteed by built-in features, such as: 100% pipe area, and controlled pressurized lubrication. Used on lines to thinning tanks, these three-way Homestead Valves have the same area as that of the pipe line, and thus permit full flow with minimum pressure drop—an important advantage on the low operating pressure of less than five pounds per square inch. Also, the exclusive *controlled* pressurized lubricant system of Homestead Valves prevents contamination of line fluids or clogging of the low pressure lines with lubricant.

Exclusive features, such as these, guarantee long low cost service from *all* types of Homestead Lubricated Plug Valves. For full information, write for Reference Book 39-5. There is no obligation.

USE THIS TIME-SAVER COUPON IF YOU PREFER.

HOMESTEAD
VALVE MANUFACTURING COMPANY
"Serving Since 1892"
P.O. BOX 128 CORAOPOLIS, PA.

Without obligation, please send me Reference Book No. 39-5 covering Homestead Lubricated Plug Valves.

Name__________ Title__________

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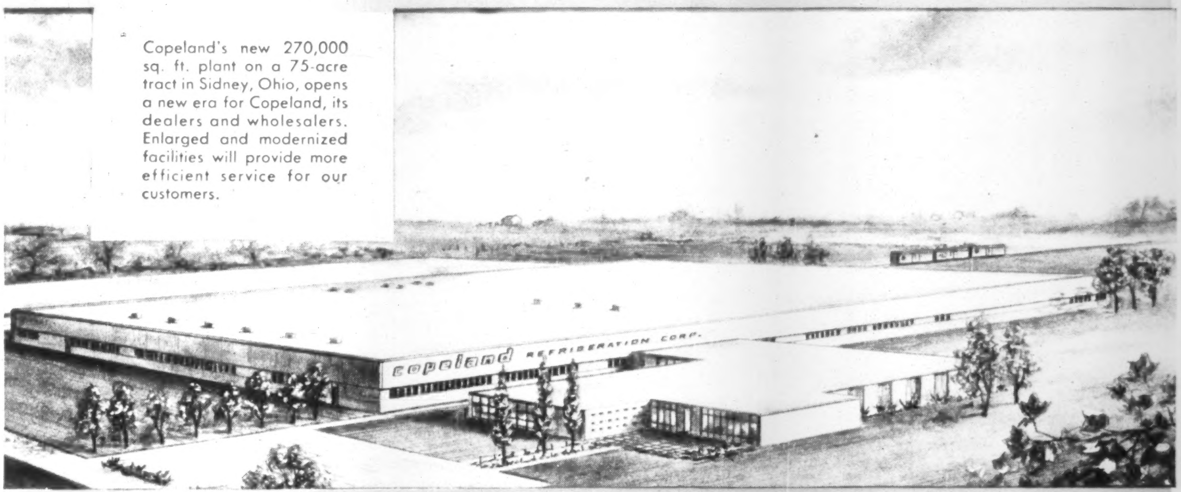
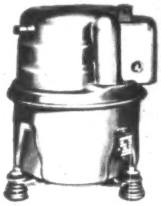
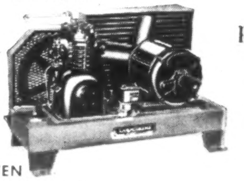
here's your future today...

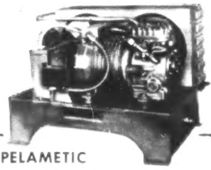

Copeland's new 270,000 sq. ft. plant on a 75-acre tract in Sidney, Ohio, opens a new era for Copeland, its dealers and wholesalers. Enlarged and modernized facilities will provide more efficient service for our customers.

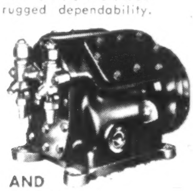
copeland REFRIGERATION CORP.

with *Copeland*


COPELAWELD
Heavy-duty performance at low current consumption.


BELT-DRIVEN CONDENSING UNITS . . .
Superior—engineered for every refrigeration need.


COPELAMETIC
the accessible hermetic . . . The industry leader for rugged dependability.


AUTOMOTIVE AND TRUCK COMPRESSORS . . .
Designed for the critical needs of truck and auto air conditioning and refrigeration.

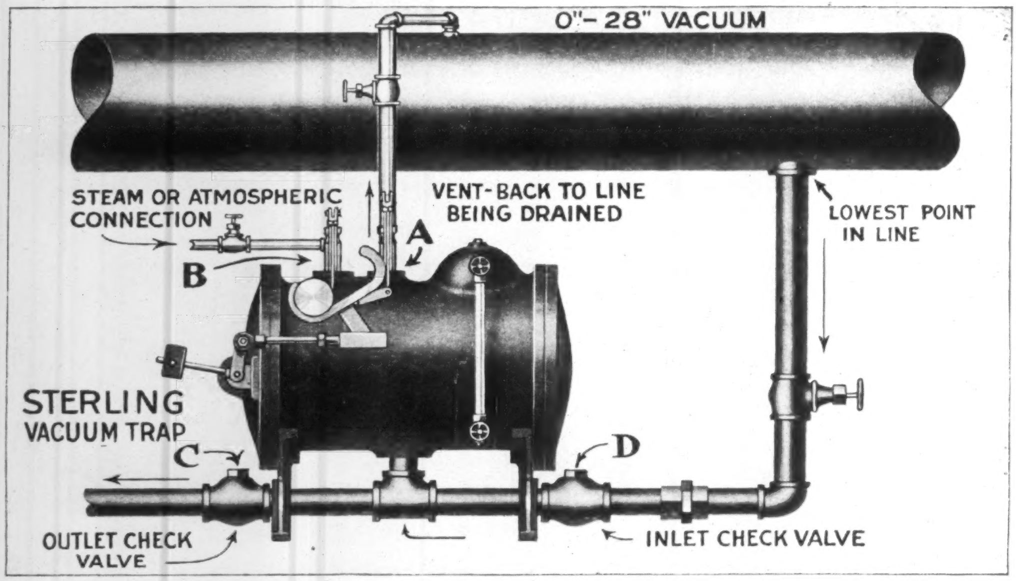
Copeland's 38-year history is one of constant growth. Our handsome new plant is only another step in a progressive tradition begun years ago. The bright future for air conditioning and refrigeration is opening up now . . . and the entire Copeland family—company, dealers and wholesalers—is ready with new facilities, new models and a new distribution policy geared to provide the kind of service that assures profitable business for all.

WRITE FOR DEALER INFORMATION

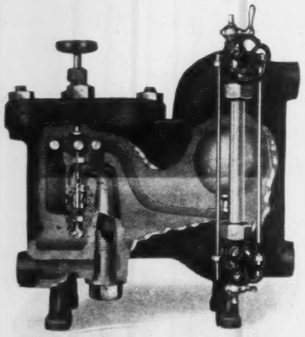
SINCE 1918
Copeland REFRIGERATION CORPORATION, Sidney, Ohio

manufacturer of the heart of America's finest air conditioning and commercial refrigeration

. . . absolute reliability
STERLING VACUUM TRAPS



STERLING SEPARATING TRAPS

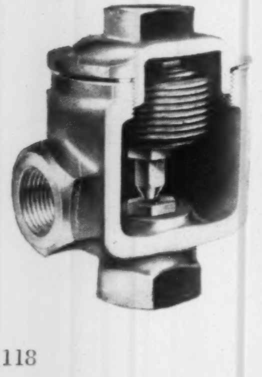


USE Sterling Float Operated Steam Traps for any type of equipment fitted with control valves, as these traps will operate on any pressure between zero and 225 pounds without further adjustments being necessary.

Ideal for use to drain compressed AIR LINES.

STERLING THERMOSTATIC TRAPS

STERLING traps are made of bronze in $1/2''$ and $3/4''$ size. for pressures from 0# to 200#, and with a full effective area of a large orifice for air removal. Should repairs ever be necessary the bellows is easily removed with a conventional $5/8''$ hex wrench. . . . no special spanner is needed!



CAPACITY

An important fact to remember when buying steam traps, is that traps are purchased to handle HOT condensation and should be bought for CAPACITY and not by pipe size. Avoid trouble by purchasing them on a CAPACITY basis as you do your boilers, engines, motors.

. . . with 7 points of superiority!

• SNAP VALVE ACTION • ACCESSIBILITY • NO TRUNNIONS • STATIONARY BODY • EASY METERING • SPECIAL FLOAT CONSTRUCTION • VALVES OF PROPER SIZE

When installed below lines or Turbines to be drained, STERLING Vacuum Traps will drain condensate from lines or Turbines under any stage or degree of Vacuum.

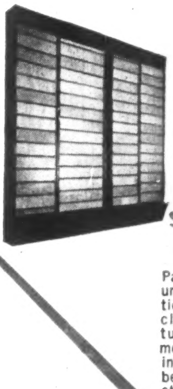
Operated by either low pressure steam or atmosphere, depending on the type of service desired.
Use STERLING Lifting Traps to pump or lift steam condensate, 2 feet for every pound pressure applied. Cannot become steam bound. Automatic Operation. Low Maintenance Cost.

We also manufacture Templeton Brothers Lift Trap in a complete range of sizes and pressures.
Your inquiry will receive prompt attention. Please write us today!

STERLING
Engineering & Manufacturing Corp.
114 BUSINESS STREET
HYDE PARK 36 BOSTON, MASS.

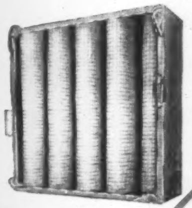
'round the world...

CONTINENTAL *clears the air*



SELF-CLEANING AUTOMATICS

Patented media design and unique "soak-then-flush" action provide thorough self-cleaning. Ferris-wheel feature eliminates reversing media to direction of air flow in back curtain—no dust can be blown back into clean air stream.



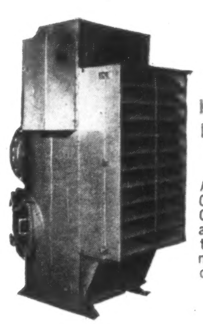
CA-24 DYCON

Oil-free, synthetic fiber media of this deep-bed (8") unit filter effectively traps and holds dust by accumulated static charge. Large dust-holding capacity. Choice of various media blankets to provide degree of efficiency desired. Easily rinsed for re-use—cuts maintenance costs.

E-Z Oil
Air Filter Oil

E-Z-OIL AEROSOL BOMB

For simple finger-tip re-oiling of viscous-type unit filters after washing.



HEAVY DUTY ENGINE AIR INTAKES

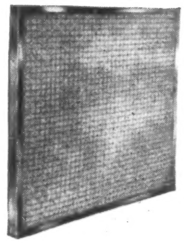
All advantages of Continental's Self-Cleaning Automatics assure maximum protection with minimum maintenance cost and effort.

E-Z-WASH UNIT FILTERS

Continental's patented media assures high efficiency, easy washing, freedom from clogging, and exceptional dust-holding capacity.

AIR
CONTINENTAL
FILTERS

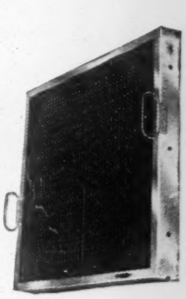
TYPE DY DYCON



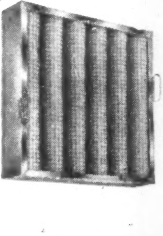
Permanent 1" synthetic fiber filter in rust-proof aluminum frame easily rinses clean under open water faucet or nozzleless hose. Exceptional dust-holding capacity means infrequent servicing. Made in any desired size.

E-Z-WASH GREASE FILTERS

All aluminum highly efficient, permanent-type filters for kitchen exhaust systems. Easily washed—once through an automatic dishwasher and they are like new again.

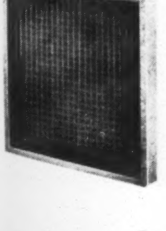


CA-20 DYCON



Oil-free, synthetic fiber media of this deep-bed (4") unit filter effectively traps and holds dust by accumulated static charge. Large dust-holding capacity. Choice of various media blankets to provide degree of efficiency desired. Easily rinsed for re-use—cuts maintenance costs.

TYPE LV SCREEN WIRE



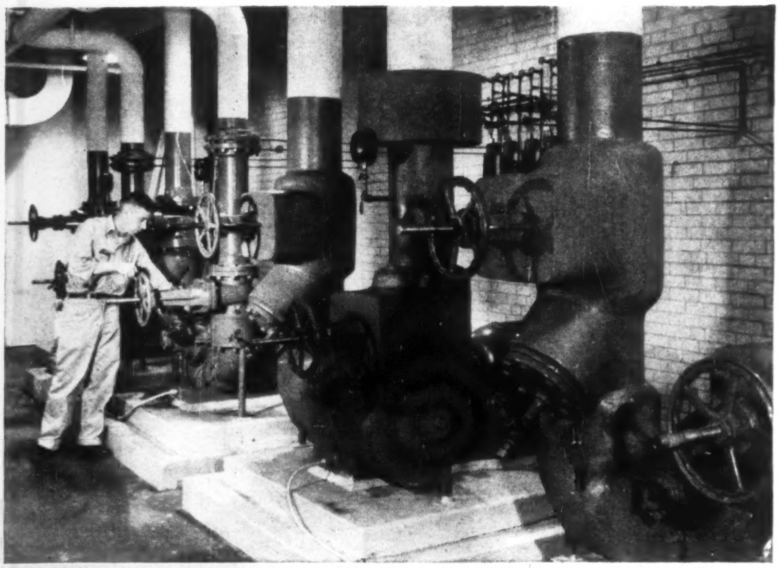
Graduated mesh-sizes in this formed screen wire filter add efficiency and dust-holding capacity. Viscous impingement, low velocity type. Available in 2- or 4-inch thickness, all standard sizes. Special sizes on order.

WRITE for catalogs, estimates . . . or contact the CONTINENTAL Sales Representative in your city.

CONTINENTAL AIR FILTERS, Inc.

P. O. BOX 1647
•
LOUISVILLE 1
KENTUCKY

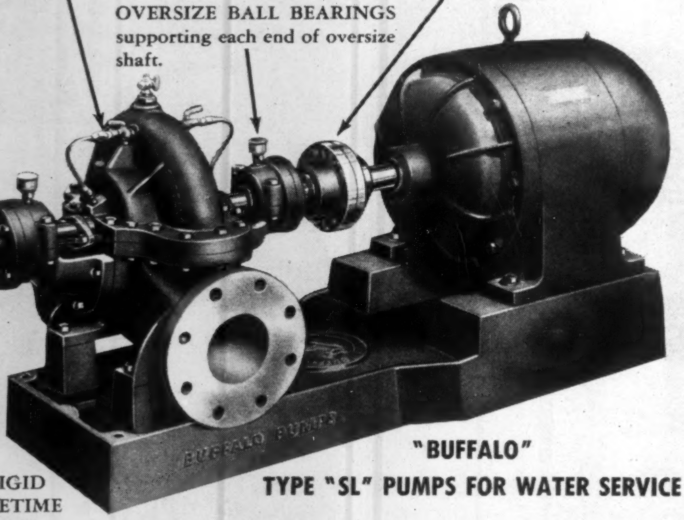
THE INSTALLATION CAN FUNCTION NO BETTER THAN ITS PUMPS —



AMPLE, HUSKY CASING has large, simply formed passages for minimum friction and hydraulic balance. Horizontally split for quick removal of upper half of casing without disturbing piping.

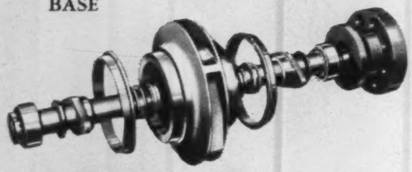
STURDY PIN-AND-RUBBER BUSHING COUPLING for flexibility and strength to carry maximum loads.

OVERSIZE BALL BEARINGS supporting each end of oversize shaft.



"BUFFALO"
TYPE "SL" PUMPS FOR WATER SERVICE

RIGID LIFETIME BASE



IMPELLER AND SHAFT CONSTRUCTION has precision hydraulically balanced impeller of the most efficient enclosed design. Note bronze wearing rings, heavy duty bearings and large diameter shaft.

"Buffalo" PUMPS

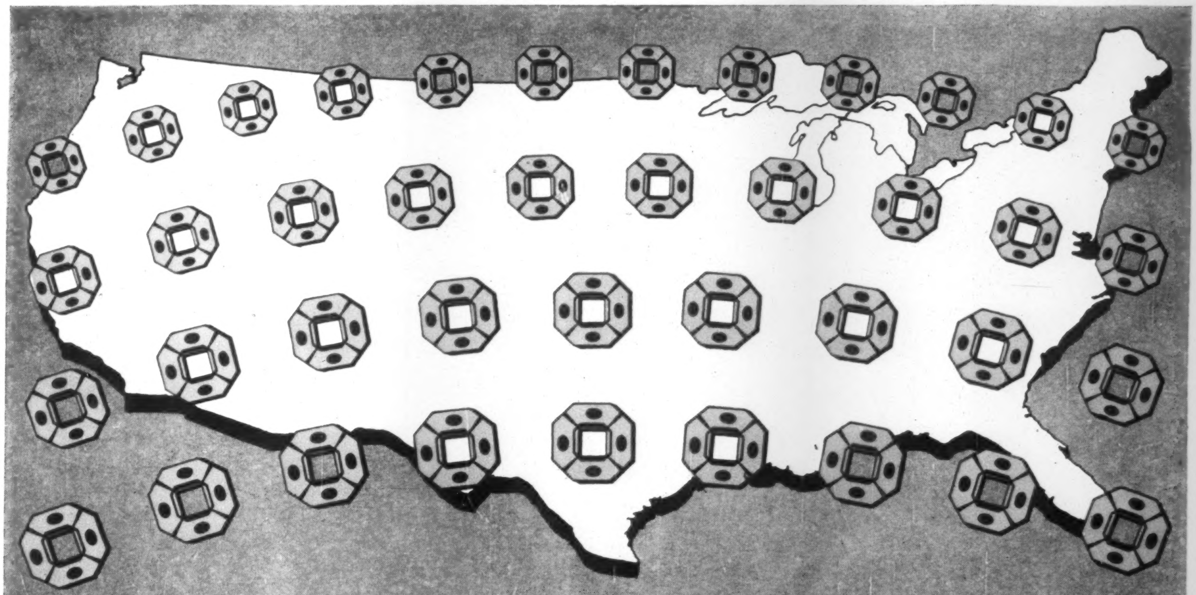
BUFFALO PUMPS
DIVISION OF BUFFALO FORGE COMPANY
171 MORTIMER ST. • BUFFALO, N. Y.
Canada Pumps, Ltd., Kitchener, Ont.
Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

— WHY NOT PICK THE BEST?

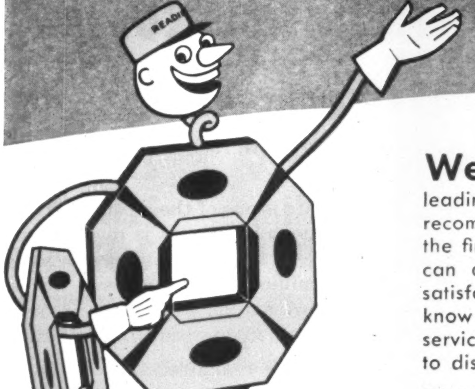
The pump is generally the least costly item in a job like the above installation, supplying chilled water for air conditioning a large store — yet it's no place for pump troubles! The contractor took no chances. He specified "Buffalo" Double Suction.

A look at the "Buffalo" features at left will indicate what we mean by "best". Literally, from impeller to coupling, it incorporates the finest obtainable materials with the best hydraulic design of our 80 years in the business. The "Buffalo" engineering and manufacturing departments have "gone the limit" to make available to you a pump that will live up in every way to the excellence of your finest installations. Bulletin 955 gives full engineering details — write for your copy!



The BEST Distributors in America SELL

READING COPPER TUBE



We, at Reading, consider it highly significant that America's leading distributors have chosen Reading Copper Tube to sell and recommend. These distributors build their business by handling the finest products—products whose quality and performance they can depend on to uphold their reputation for giving customer satisfaction. Of equal importance to them is service. And they know from experience that Reading's streamlined, shirt sleeve service eliminates delays . . . speeds delivery from factory . . . to distributor . . . to contractor. Next time you need copper tube . . . specify Reading . . . precision product of one of America's largest, completely integrated mills, specializing in the processing of copper tube from basic metal to finished tubing . . . and sold by America's best distributors.

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HOUSTON, TEXAS
1121 Rothwell St.

OAKLAND, CALIF.
410 Hegenberger Road

LOS ANGELES, CALIF.
120 No. Santa Fe Ave.

DENVER, COLO.
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CLEVELAND, OHIO
4615 Perkins Ave.

ATLANTA, GA.
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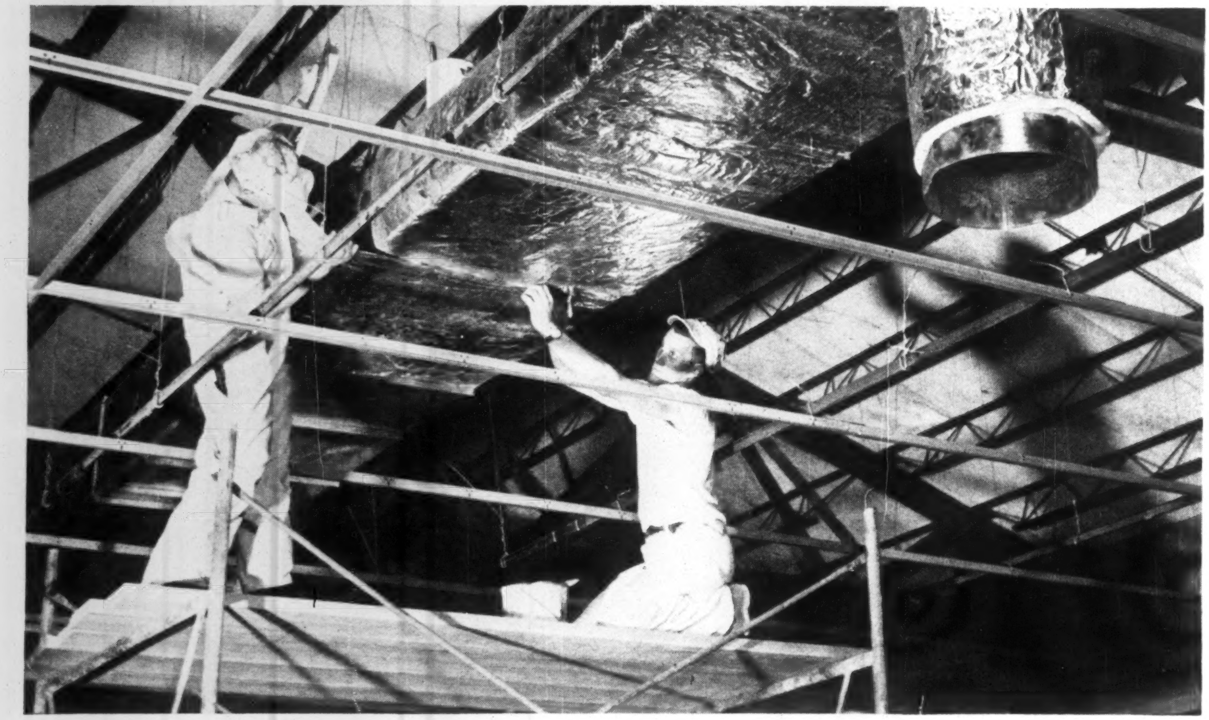
S.W., Unit 5, Bldg. B

Sold Through Wholesalers Only

INSULATION News from L·O·F GLASS FIBERS COMPANY



"Foil-faced Microlite cuts installation costs . . . boosts insulating efficiency"

—says John Hayes, Service Products, Inc., Toledo, Ohio.

Service Products, Inc., used foil-faced Microlite to prevent condensation on sheet metal air-conditioning ducts in Toledo's University Bowling Alleys. Working on scaffolds, the men brushed adhesive on ducts where edges of insulation butted together, and sealed the handy attached 2" tabs with adhesive . . . all more quickly than is possible with other blanket-type insulating materials!

Look at all the dollar-saving advantages you get from Microlite . . .

- *Easy to handle on scaffolds*—extremely light in weight!
- *Easy to cut and fabricate*—eliminates the need for precision cutting and fitting and for special skills and tools!
- *Resists tearing*—high tensile strength allows workmen to pull it through tight spots safely!
- *Economical to store*—compression-packed rolls take up a fraction of the space of ordinary insulations.

Microlite is one of the most effective insulations known. It is made from countless fine glass fibers which form millions of sound- and heat-trapping air cells. What's more, these glass fibers won't rot or burn!

Microlite is available with foil, vinyl and other plain or reflective facings, extended beyond edges of insulation to form tabs. For full details, check the Yellow Pages for the nearest distributor; or write: L·O·F Glass Fibers Company, Dept 39-17, 1810 Madison Avenue, Toledo 1, Ohio.

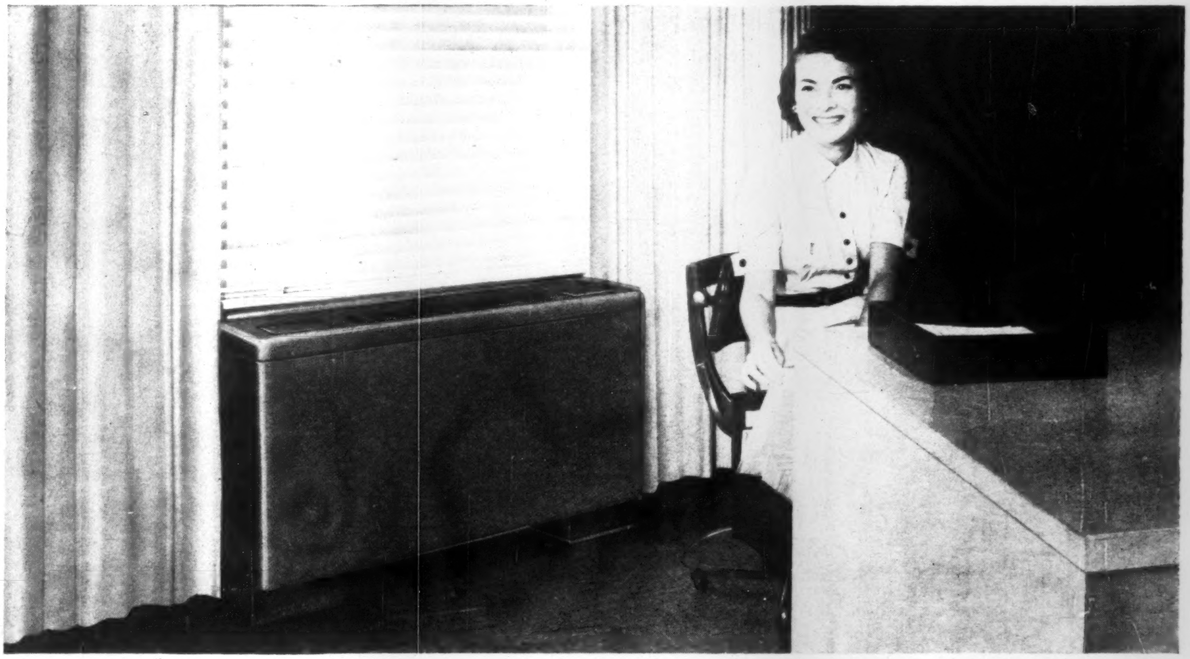
LOF
GLASS FIBERS
MICROLITE
INSULATION

L·O·F GLASS FIBERS COMPANY

TOLEDO 1, OHIO

Makers of glass fibers by the "Electronic-Extrusion" process

THE NEW *Airtherm* AIR CONDITIONING UNIT



COMBINES THE BEST TIME-PROVED FEATURES IN THE INDUSTRY

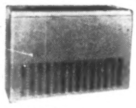
FOR NEW OR EXISTING

- ✓ OFFICES
- ✓ MOTELS
- ✓ HOTELS
- ✓ APARTMENTS
- ✓ INSTITUTIONS
- ✓ PUBLIC BUILDINGS

Here is Airtherm's answer to the demand for remote air conditioning without expensive ductwork. Features that have performed best in actual usage through the years are combined in this unit to give: (1) Maximum efficiency and operating life; (2) Quiet operation; (3) Versatility of installation; (4) Attractive appearance that blends with new or old buildings.

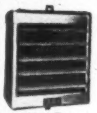
Airtherm units are made in four series from $\frac{1}{2}$ to 2 ton nominal cooling capacity for cabinet or concealed installation, floor or ceiling.

AIRTHERM HEATING AND VENTILATING PRODUCTS

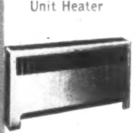


Cabinet Unit Heater

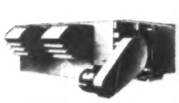
Gas Fired Unit Heater



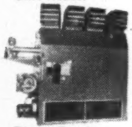
Propeller Fan Unit Heater



Convectior



Centrifugal Fan Unit Heater



Direct Fired Space Heater

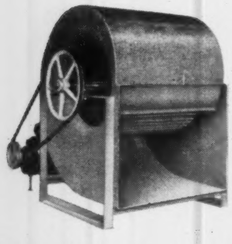
MAIL COUPON FOR DETAILS

Airtherm Manufacturing Co., Dept. A
700 S. Spring • St. Louis 3, Mo.

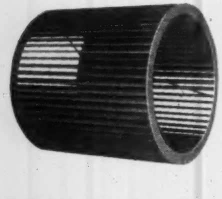
Please send specifications on the following products as checked ☐ Airtherm Air Conditioning Units ☐ Cabinet Unit Heaters ☐ Convectors ☐ Gas Fired Unit Heaters ☐ Propeller Fan Unit Heaters ☐ Centrifugal Fan Unit Heaters ☐ Direct Fired Space Heaters.

NAME ....FIRM ....

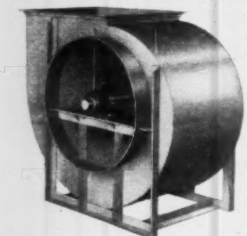
STREET ADDRESS .... CITY .... STATE ....



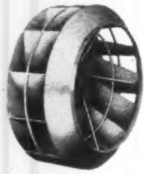
BFC, DI-DW Blower.



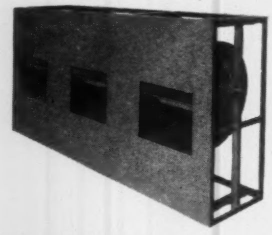
BFC, DI-DW Wheel.



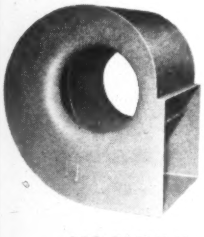
BBI Blower, SI-SW, Arrangement No. 3
Class 4.



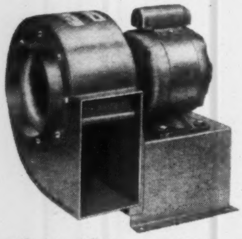
BBI Blower Wheel,
SI-SW. Class 2.



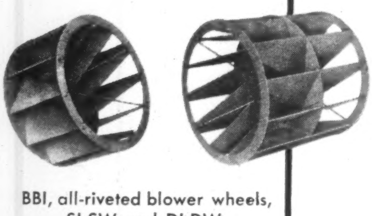
Triple BFC Blower Assembly.



BFC, DI-DW Housing.



Direct Drive, All-Purpose Utility Blower



BBI, all-riveted blower wheels,
SI-SW and DI-DW.

MAKE
BARRY
BLOWER COMPANY
your dependable low cost source of supply for
Power Fan Equipment

We offer users of power fan equipment a full line of blowers, multiple blower assemblies, direct and belt driven ventilating sets, cast iron blowers and various types of centrifugal blower wheels and housings. All sizes from 6″ to 73″.

All BARRY blower wheels and housings are precision made from steel, aluminum, brass, copper, or stainless, and are expertly balanced and trued before shipment.

We make power fan equipment *exclusively* and do not compete with our own customers . . . and, we have a high reputation for dependable quality and remarkably fast delivery. Let us quote on our standard equipment, or upon your special sizes and specifications. Write today.

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our products at
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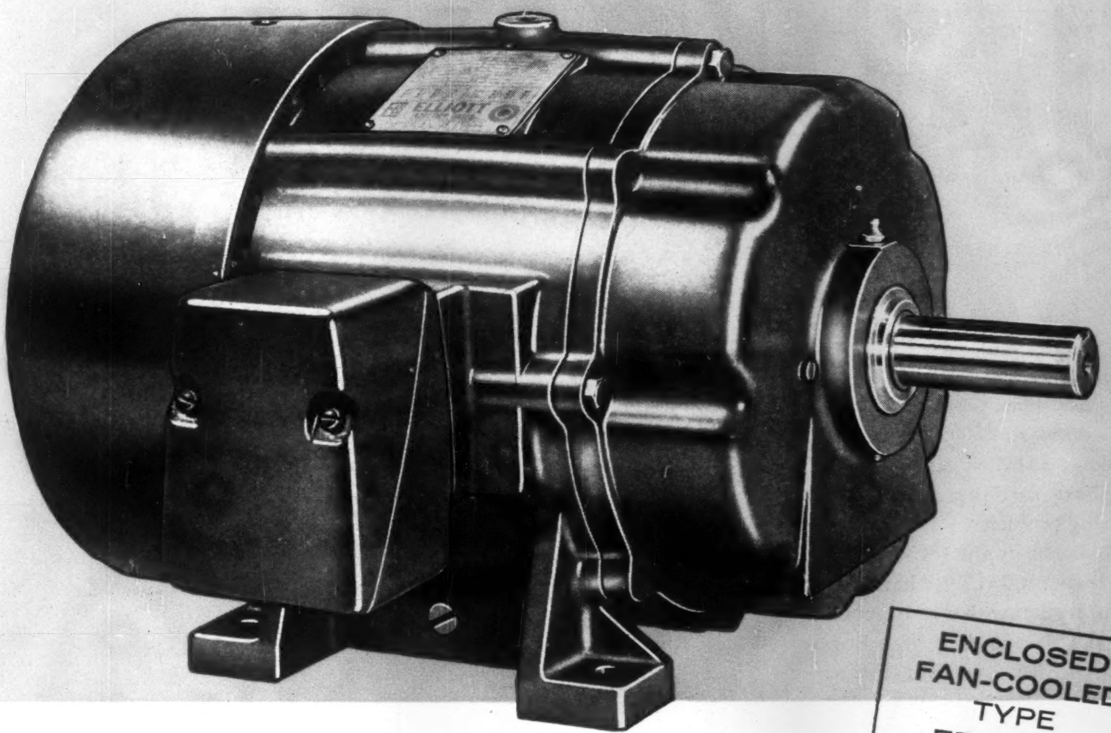
★ **A few territories are available for qualified sales representatives.**

BARRY BLOWER COMPANY
3100 California Street, N. E. • Minneapolis 18, Minnesota

Inside and Outside . . entirely new



ENCLOSED FAN-COOLED TYPE FRAMES 184-256U

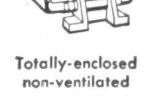
Elliott C-W Type N Motors

NEW PERFORMANCE! You get more horsepower per pound from these compact Elliott C-W motors because of their improved design, and the use of vastly superior insulating materials and electrical steels. Due to greater mechanical and dielectric strength, insulating materials occupy less space. More space is available for copper—the "muscle" of the motor.

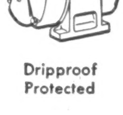
NEW PROTECTION! Internal parts of Elliott C-W motors are completely protected by rugged housings—dripproof, or totally-enclosed, as required. Efficient fans assure ample cooling.

NEW DEPENDABILITY! New Elliott C-W type N motors are designed for the utmost in dependability. They will withstand physical abuse. Use of highly dependable insulating materials assures prolonged life; anti-friction bearings are available in several optional types, to meet severe service conditions.

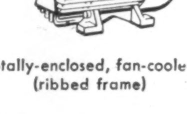
OTHER C-W TYPE N MOTOR ENCLOSURES



Totally-enclosed non-ventilated



Dripproof Protected

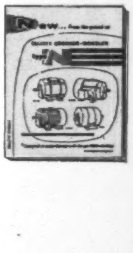


Totally-enclosed, fan-cooled (ribbed frame)

ELLIOTT Company

CROCKER-WHEELER DIVISION

WRITE for new bulletin describing Elliott C-W Type N Motors. Address: Elliott Company, Crocker-Wheeler Division, Jeannette, Pa.



W6-4

JONES & LAUGHLIN INTRODUCES

JALZINC*

JALZINC is Jones & Laughlin's new trade name for its *high quality* zinc coated steel sheet and coiled product. JALZINC answers your toughest forming, rolling and drawing problems.

Produced by the proven Sendzimir process, JALZINC has a tight, uniform coating that resists cracking and flaking. The high lustre finish greatly improves the appearance of your end product. JALZINC is available in a wide range of gages and widths in both cut lengths and coils.

Users are enthusiastic about JALZINC'S uniform ductility, flatness and surface finish. Write today for complete details.

Jones & Laughlin Steel Corporation
Dept. 511, 3 Gateway Center
Pittsburgh 30, Pa.

☐ Please send literature on JALZINC
☐ Please have J&L representative call

Name________________

Position________________

Company________________

Address________________

City________ Zone________

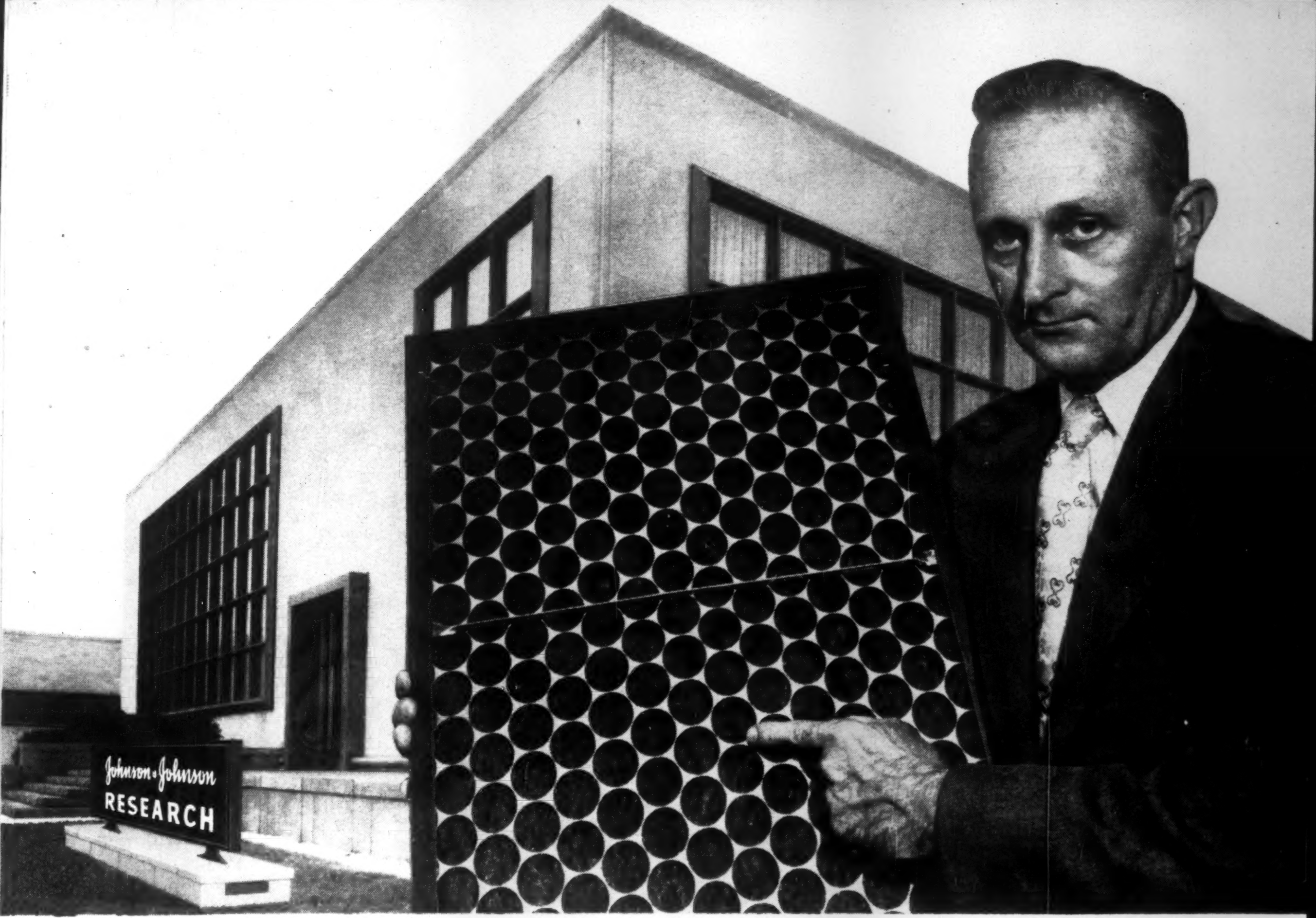
State________________

*Registration applied for.

J&L inspector examines a roll of 18 gage JALZINC as it is coiled on a reel of the new Sendzimir continuous line.

J&L STEEL

Jones & Laughlin
STEEL CORPORATION · PITTSBURGH



"We like the high efficiency and easy handling of Glasfloss Air Filters"

says Mr. Alexander Bors, Maintenance Supervisor at Johnson & Johnson

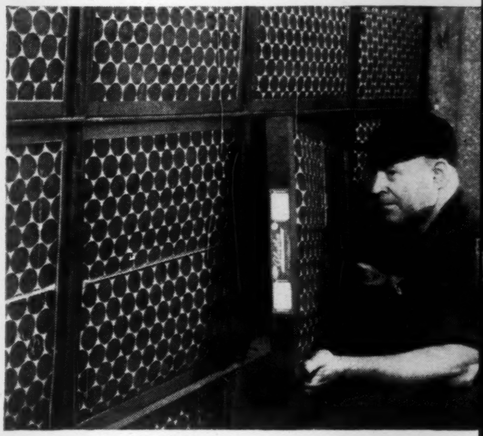
In the plant offices of Johnson & Johnson, New Brunswick, New Jersey, employees enjoy exceptionally clean, decontaminated air at minimum costs to the company.

Plant personnel state that the highly efficient filtering action and handling ease of Glasfloss Air Filters have made such results possible. Mr. Charles Sutton, field and maintenance engineer, puts it this way. "After three years of Glasfloss, we are convinced that we have obtained the optimum of filter efficiency and ease of handling . . . more than 90% of the contamination is removed by Glasfloss units . . . an obvious improvement over previously used spun glass filters."

Such results have led the company personnel into planning Glasfloss Filtering for a new surgical dressings research and manufacturing plant now under construction.

What's different about Glasfloss that makes such filtering efficiency possible? First, Glasfloss uses only extremely fine, silky glass fibers that are kind to hands and skin. Lighter-to-heavier density of media from front to back stops surface loading, dust and dirt builds up from the inside out. To you, this means Glasfloss catches more dust and dirt, doesn't hamper the flow of cooled or heated air, lowers maintenance costs. Write for complete information on Glasfloss Filters now, ask for Bulletin DF3. Address your request to Glasfloss Dept., Fiber Glass Division, Pittsburgh Plate Glass Company, One Gateway Center, Pittsburgh 22, Pennsylvania.

Mr. Bors points to one of the many sizes of Glasfloss Filters used at Johnson and Johnson's research center and other plants and offices in New Brunswick, N.J.



Over 800 tons of refrigeration supply cold water to 20 individual unit conditioners. All fresh and re-circulated air is filtered by Glasfloss in these units at the total rate of 320,000 cfm.

GLASFLOSS IS A PRODUCT OF THE FIBER GLASS DIVISION OF PITTSBURGH PLATE GLASS COMPANY

Sales Offices are located in the following cities: Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia and St. Louis

FIBER PPG GLASS

PAINTS · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

GREENLEE BROS. & CO. CUT FUEL COSTS 17%

B&W boilers with Jet Ignition Stokers assure savings despite increased fuel prices

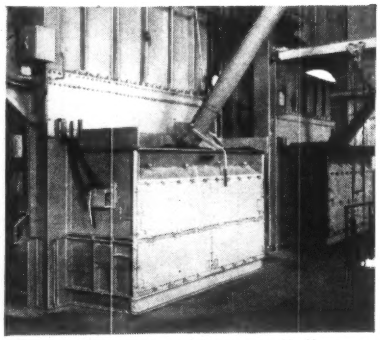
As one of the country's leading machine tool manufacturers, Greenlee Bros. & Co., Rockford, Illinois uses large amounts of steam for all year operation of air compressors and for plant heating. And to maintain profitable overall operation it is important that the steam supply be dependable—and steam generating costs kept to the minimum.

Since the installation of two B&W Integral-Furnace Boilers, Greenlee has enjoyed uninterrupted steam service from a dependable, efficient source. Equipped with modern B&W Jet Ignition Stokers, these units have built a record of operating efficiency while burning a wide variety of Illinois bituminous coal.

At Greenlee, as at other industrial plants using steam, careful consideration of long term costs and proven reliability were important factors in the choice of B&W Integral-Furnace Boiler units.

If your steam production cost is important . . . if you are considering steam plant modernization or expansion for increased dependability and efficiency . . . it will pay you to investigate B&W's more than 90 years of boiler experience. Let us show you what it can do for you.

For further information or assistance write to The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.


Two B&W Integral-Furnace Boilers at Greenlee, equipped with B&W Jet Ignition Stokers, burn a wide variety of Illinois bituminous coal.

HERE'S WHY YOUR STEAM COSTS LESS
With B&W Integral-Furnace Units

- Minimum floor space and headroom requirements
- High fuel economy
- Smokeless combustion
- Adaptable to all fuels and firing methods
- Economical fast steaming
- Water-cooled furnace
- Clean, dry steam at all ratings, even with high boiled water concentration
- Quick response to wide and heavy load swing demands
- Easy to inspect and clean
- High availability with least attention

BABCOCK & WILCOX

B&W

BOILER DIVISION

G-827-1B

The Editors' Pages

They Do Not Fight Alone

MARCH OF DIMES
FIGHT INFANTILE PARALYSIS
JANUARY 2-31

FINAL VICTORY is now in sight. Thanks to the Salk vaccine, which was financed with March of Dimes funds, tomorrow's children will be spared the tragedy of polio. Thousands of today's children, however, still suffer from this crippling disease. They — and thousands of adult victims also — need our help. They need much more than an inoculation. They need mechanical substitutes for arms and legs and lungs. They need help in rebuilding shattered lives. Most of all, they need the hope which comes from knowing that they do not fight alone. And the National Foundation for Infantile Paralysis counts on the rest of us again this year to enable them to speed the day of victory over polio.

To Complete Cooling of World's Tallest Building

. . . climaxes 25th anniversary

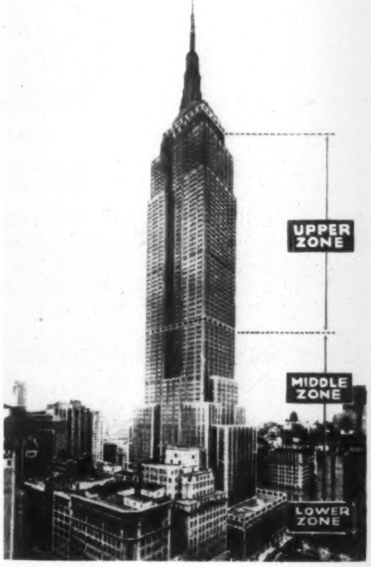
THE FINAL STAGE of an intricate project to provide air conditioning for all office workers in the world's tallest skyscraper, New York's famous Empire State building, will be completed next spring, according to Col. Henry Crown, chairman, Empire State Building Corp.

Two powerful compressors, providing 3350 tons of cooling, will be added to the 1900 ton capacity which now provides cooling for many tenants. The total of 5250 tons of cooling capacity will handle the air conditioning demands of all 25,000 tenants on the 85 office floors.

Completed in 1931, it took nine years for the Empire State building to be fully rented, and it has been filled ever since. The 60,000 tons of steelwork in the building represents the largest single steel order ever placed for building construction.

Cooling the 1472 foot skyscraper began in 1951, when the management installed a 350 ton compressor to handle requirements for the basement through the fifth floors — lower zone — and a 600 ton compressor to take care of requests for cooling on the sixth through 41st floors, or middle zone.

In 1953, additional demands for air conditioning prompted the addition of another 600 tons of cooling for the middle zone and the installation of 350 tons of cooling for the top zone. As tenants requested air conditioning, headers were run through the various corridors extending from the building's vertical risers, which were installed in 1951 when the project began.



EMPIRE STATE BUILDING, world's tallest skyscraper, requires 5250 tons of cooling capacity for 25,000 tenants on 85 office floors

Continued tenant demand for air conditioning resulted in management's determination to provide cooling capacity for the entire occupied area. To accomplish this, 1550 tons of cooling will be added to the upper zone; 1800 tons will be added to the middle zone and one of the 600 ton compressors formerly servicing the middle zone will be relocated in the engine room for the lower zone. The lower zone will now have a total of 950 tons of cooling, the middle zone will receive 2400 tons, and the upper zone will benefit from 1900 tons.

Now celebrating its 25th birthday, the Empire State Building's huge air conditioning project will be completed in time for the start of its second quarter-century.

The entire project has been under the direction of the firm of Edward E. Ashley, consulting engineers. ≠

Purdue Dedicates Center For Basic Climate Study

. . . to affect man and animals

A RESEARCH CENTER for basic investigations in refrigeration, air conditioning, and environmental physiology was recently dedicated at Purdue university, Lafayette, Ind. Objectives of the climate control studies are greater human comfort, increased animal productivity, and increased industrial efficiency and production.

Known as the Purdue university Center for Refrigeration and Climate Control, it is housed in a large separate building made possible by a generous gift of $300,000 by the Herrick Foundation and Tecumseh Products Co. In addition, Purdue has made available $252,500 for present staff and supplies.

"Despite the progress in the use of cooling during the last 100 years, the possibilities for better uses of the refrigeration principle have been barely tapped," according to Dr. Ralph A. Morgen, research director of the Purdue Research Foundation. "In order to take full advantage of the principles of removal of excess energy, much more basic information must be obtained about the principles of refrigeration and about the effects of refrigeration, air conditioning, and other climate control on man's comfort and efficiency, and animals of economic importance." ǂ

How Buildings Figure Air Conditioning Expense

. . . in operating, depreciation accounts

AIR CONDITIONING costs are being figured and reported by more large buildings every year, according to Irwin K. Smith, of the National Association of Building Owners and Managers, writing in a recent issue of Skyscraper Management.

Ninety buildings reported air conditioning expense in 1954, he reports. Seventy-nine of these gave a breakdown of the expense as follows:

	Cents, Sq Ft	No. of Buildings
Wages	6.5	70
Supplies	2.0	69
Fuel	2.5	13
Electricity	7.2	73
Water	2.0	18
Outside	2.3	32
Unclassified	0.6	20
Total	17.2	79

The initial cost of the installation may be recaptured as depreciation by any one of several methods, Mr. Smith said. "In the 1954 code, depreciation on new assets with at least three years useful life and put into service on or after January 1, 1954, may be figured by the "double" declining balance, sum of years digits, or any other consistent method. Of course, all previous methods are still available too as shown in Table 1.

"Briefly, figured on an asset with a 10 year life, they are 10 percent the first year and 10 percent each year for 10 years; or either 15 or 20 percent of the cost the first year and then 15 or 20 percent of the remaining balance thereafter; or add the year digits 1 through 10 for a total of 55, take 10/55's the first year, 9/55's the second year and so on; or figure out a combination that does not write off more in the first 2/3's of useful life than the declining balance would.

"It isn't necessary that the same method be used throughout the system. Ducts and other parts that are more or less permanent can be depreciated on a straight line, while the declining balance method is used on the machinery. Accelerated schedules may be used during the fiscal years of the use of an asset and the straight line method applied during the remaining life. The combination is shown by Column 5, Table 1." ǂ

TABLE 1—DEPRECIATION METHODS available under the 1954 Code are compared here for writing off the initial cost of an air conditioning system

	1	2	3	4	5
Years	Straight line	150 Percent declining balance	200 Percent declining balance	Sum of digits	Combination 200 Percent declining Balance and straight line
1	1000	1500	2000	1818	2000
2	1000	1275	1600	1636	1600
3	1000	1083	1280	1454	1280
4	1000	921	1024	1272	1024
5	1000	783	819	1090	682
6	1000	665	655	909	682
7	1000	565	524	727	682
8	1000	480	419	545	682
9	1000	408	335	363	682
10	1000	347	268	181	682

HPAC Show Number Coming in February

. . . features 13th exposition

NEXT MONTH don't miss HPAC's special feature on the 13th International Heating, Ventilating & Air Conditioning Exposition to be held at the International Amphitheater, Chicago, February 25 - March 1.

You'll find complete information on the Show, with a "preview" of all the exhibits, including the names of booth personnel.

Look for the handy guide card at the beginning of the Show Section for planning your visit in advance. On it the location and number of every booth are plainly marked so you can map out your tour of the exhibits you most want to see. The card tears out easily and folds to convenient pocket size for ready reference at the Show. ǂ

15 Percent Rise Seen For Air Conditioning

. . . in 1957

RECORD SALES coupled with keener competition in the air conditioning industry in 1957 are predicted by D. C. Minard, president of The Trane Co.

Buoying activity will be booming industrial and consumer demands. Mr. Minard estimates an overall industry wide sales increase of about 15 percent.

Existing buildings will be air conditioned at an increased rate this year, and each new building represents a prospect for air conditioning, he believes.

For what to expect in other sections of the heating, piping, and air conditioning field, turn to HPAC's round-up of forecasts which begins on page 146. ǂ

"Quote"

"Troublesome problems can often be solved by helping employees work smarter not harder. The five steps are: (1) Pick a job that needs improving; (2) Get all the facts; (3) Question each detail; (4) Work out an easier method; (5) Apply this new method."—*Leo F. Collins, coach of the work simplification Committee, Central Heating Dept., The Detroit Edison Co., and a member of HPAC's board of consulting and contributing editors.*

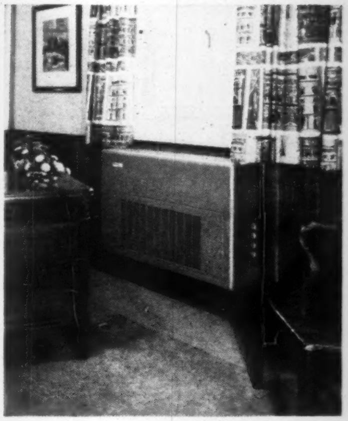
IN THE HANDS OF YOUR WARREN WEBSTER MAN

Webster manufactures heating and cooling equipment. But Webster's finest product is the Warren Webster Man, the man who sells year-round comfort! For, in the hands of your Warren Webster Man, your comfort problems are more than just a job — they're a way of life.

Your Warren Webster Man is pledged to make certain your job is right and that it stays right, always.

Take, for example, this Webster Newport Year-Round Air Conditioner installed in a 20-year-old office building. It's far more than just the answer to your heating and cooling modernization needs. For behind it stands Webster's finest product — the Warren Webster Man. Call him today.

Warren Webster & Company, Camden 5, New Jersey. Since 1888. Offices in 66 Principal U.S. Cities and Canada.



Webster's Finest Product . . . the Warren Webster Man

WARREN WEBSTER

HEATING . . . COOLING

Soon on

ANACONDA

copper tubes

A color stripe will show the type AND size

ANACONDA 1¼" L
MADE IN U.S.A.

The color code

Type K, green—Type L, blue—Type M, red—Type DWV, yellow—Type TP, gray

Before long your Anaconda distributor will be receiving from the mills and warehouses of The American Brass Company color-coded copper tube (straight lengths). This will mean easier and quicker type identification in the distributors' stock rooms, in your shop and on the job.

The color markings run the length of the tube with "ANACONDA," the type letter and size repeated at frequent intervals. In full lengths or short pieces you can easily spot the tube you want.

The ink used in color striping is easily removed when ends are cleaned for soldering. 5603

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COPPER TUBES

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BUY FROM AN ANACONDA DISTRIBUTOR

"Open for Discussion"

• WE FOLLOW HERE each month the practice at engineering society meetings of providing an "open for discussion" period. You are urged to take part. Just address your comments to the Editors, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2.

Employee Training Article Shows How to Increase Employees' Value

I HAVE SOME QUESTIONS regarding the article, *Journeymen Sheet Metal Workers Go to (Company) School Again*, by William J. Rettenmier, in the November HPAC.

1) Are these classes on company time or on the employees' time? Are the employees paid while attending?

2) Is attendance voluntary or compulsory?

Answers to these will give a very welcome addition to the public information about "on the job training" and should give other employers of craftsmen ideas of how these employees can increase their value.

G. ASHBURN KOCH
George Koch Sons, Inc.
Ventilating Contractor
Evansville, Ind.

THE AUTHOR'S REPLY—Answering both of Mr. Koch's questions together, participation in these classes is entirely voluntary and by invitation. It would not be in order to clutter up the classes with people who had not acquired a fairly reasonable knowledge of high school mathematics nor with those who might be induced by the knowledge of the free dinner which precedes the class to experiment with an additional evening "out". The men are strictly on their own time.

WILLIAM J. RETTENMIER
Vice-President
Spitzley-Rettenmier Sheet Metal Co.
Detroit

75 Percent of Ductwork for School's Warm Air System Was Unnecessary

FROM the ductwork layout shown in the article, *Forced Warm Air Heats New School*, by Fred S. Dubin, in the June HPAC, I'd say that most of the ductwork is unnecessary.

It is exceedingly difficult to comment on an article which contains so little definite information as this one. The stated capacity of the furnace is a rated output of 1 million Btu per hr. No rating is given on the fan, no information given as to the volume of air handled, and the entire emphasis seems to be on the method of distribution by the perimeter system.

As I look at the plan and attempt to reconstruct a floor plan of the rooms above the duct plan, my thought is that about three-fourths of the duct system as laid out is entirely unnecessary and that equal results could be gotten with that much less ductwork. I am a believer that ductwork helps a job, but I don't believe that the location of an opening within a room has much to do with the distribution. It seems to me that it would be possible to get equally good results in this school with about one-quarter of the ductwork indicated on the plan.

Another question occurs to me, based on some experience I've had myself. The article states that the designers were compelled to go to a warm air job because of the high water table and the floor of the school being right on the ground, which prevented their installing steam lines between the different buildings from a central steam plant. But the return air plenum is 4 ft deep, possibly necessarily so because the return air ducts cross underneath the supply ducts. If the water table is too high to prevent the passage of steam lines between the buildings, what is to prevent this entire return air system from filling with water? It might even get full before the roof is on the building and stay full unless somebody pumps it out. We have had things like that happen to underground ducts in several different buildings. No mention is made in the article of any way to pump it out or to prevent the high water table making trouble along that line.

Then another thing that I would like to question is the statement, "A riser tapped into the return air ducts extends vertically to a roof exhauster, so that a portion of the air leaving the all purpose room is discharged outdoors." If the purpose is to comply with the state law, then they should change the state law, because exhausting air from the floor of a room is taking the best air in the room out. This is the air which has leaked in, mixed with air that has cooled off and dropped down. Such air makes good ventilating air and frequently just as good as air from outdoors.

I would commend the bypass system which Mr. Dubin describes. Good ventilation could be had in that building if the bypass dampers are properly controlled, even if nothing else was done in the way of ventilation. The warm air system has that advantage over what other types of systems can do.

Furthermore, it is absolutely surprising to those not initiated to note the very live freshness of the air in a school building where the bypass system is used with the bypass damper properly controlled to control the temperature of the rooms, but at all times giving a constant supply of air to the room, heated or otherwise.

Finally, this article has overlooked one of the very important parts of the job, in my judgment, in not stressing the volume of air handled in relation to the volume of air in the building.

There's no reason why a system like this won't work if the capacities are right in the furnace, the fan, and the ducts.

E. K. Campbell
Chairman of the Board
E. K. Campbell Co.
Kansas City, Mo.

The Author's Reply — Regarding location of supply registers, our experience has shown that it is extremely important to have proper supply within the room in order to avoid drafts, to kill the cold air downdrafts at window walls, and to provide as wide a distribution of air within the room as possible. We feel that a continuous air supply below the glass is highly desirable. Most of our jobs are designed this way.

The duct air system as originally designed does help heat the floor. The warm floor effect cannot be accomplished by eliminating three-quarters of the duct system. The question of the return air plenum being below the water table and therefore not presenting any more problems than that of an underground piping system between buildings below the water table neglects the fact that it is easier to waterproof a small localized plenum chamber than it is to treat an extensive underground piping system below the water table. If water should enter the plenum chamber during construction or even after construction, means have been provided for pumping it out. Since the plenum is a "dry" system, the consequence of immersion is much less serious than if it were an insulated pipe.

State law does require that air be exhausted from the rooms at a low level especially in multipurpose rooms and auditoriums. We agree that this causes a hardship in design at times and does not always assure that the foulest air leaves the room. However, we do not feel that with the amount of air change required in Massachusetts and the amount of outdoor air required — 15 cfm per pupil — that there is much difference where the air leaves the room. I believe that the physical considerations are perhaps the best governing factor. The bypass system of dampers we have found to be the only satisfactory method of providing adequate ventilation and proper air delivery at all times.

We favor forced warm air where applicable, and I want to correct any impression that warm air was selected for this job over steam because of the physical factors involved. We agree that a warm air system provides adequate ventilation, temperature control, humidification, and flexibility, providing that the building construction can accommodate the duct system. We do feel, however, that there have been a great number of forced warm air jobs installed without due regard to the design of the distribution system, which simply blows some air into the room at any point at random. Such inferior jobs have given warm air a "black eye" and has caused it to suffer setbacks. It would be unfortunate if warm air, which can do such an outstanding job of heating this type of building, were to be discriminated against simply because of some bad installations emanating from expediency rather than from good design.

Fred S. Dubin
Fred S. Dubin Associates
Consulting Engineers
Hartford, Conn.

For Greater Comfort, Furnishings Should Be Poor Heat Conductors

The primary objective of any heating and air conditioning system is to provide complete indoor comfort for all the occupants in the space.

Great advances have been made in improving the properties of the air in the room by controlling the temperature, the humidity, and the contents of odors and other impurities, and by eliminating drafts. Also, careful consideration is given to the walls, ceilings, and floors surrounding the spaces in order to avoid using materials with too high conductivity which creates, by heat absorption, a cold feeling. This is one of the major reasons why radiant heating panels concealed in floor, walls, or ceiling permit a lower room air temperature. Part of the heat conducted from the warmer bodies to the cooler air is equalized by the heat radiated from the heating panels.

In this way we have made considerable progress. However, in the last few years a lot of furniture has been introduced into our schools and assembly halls which contradicts the considerations which have been followed for designing the enclosures.

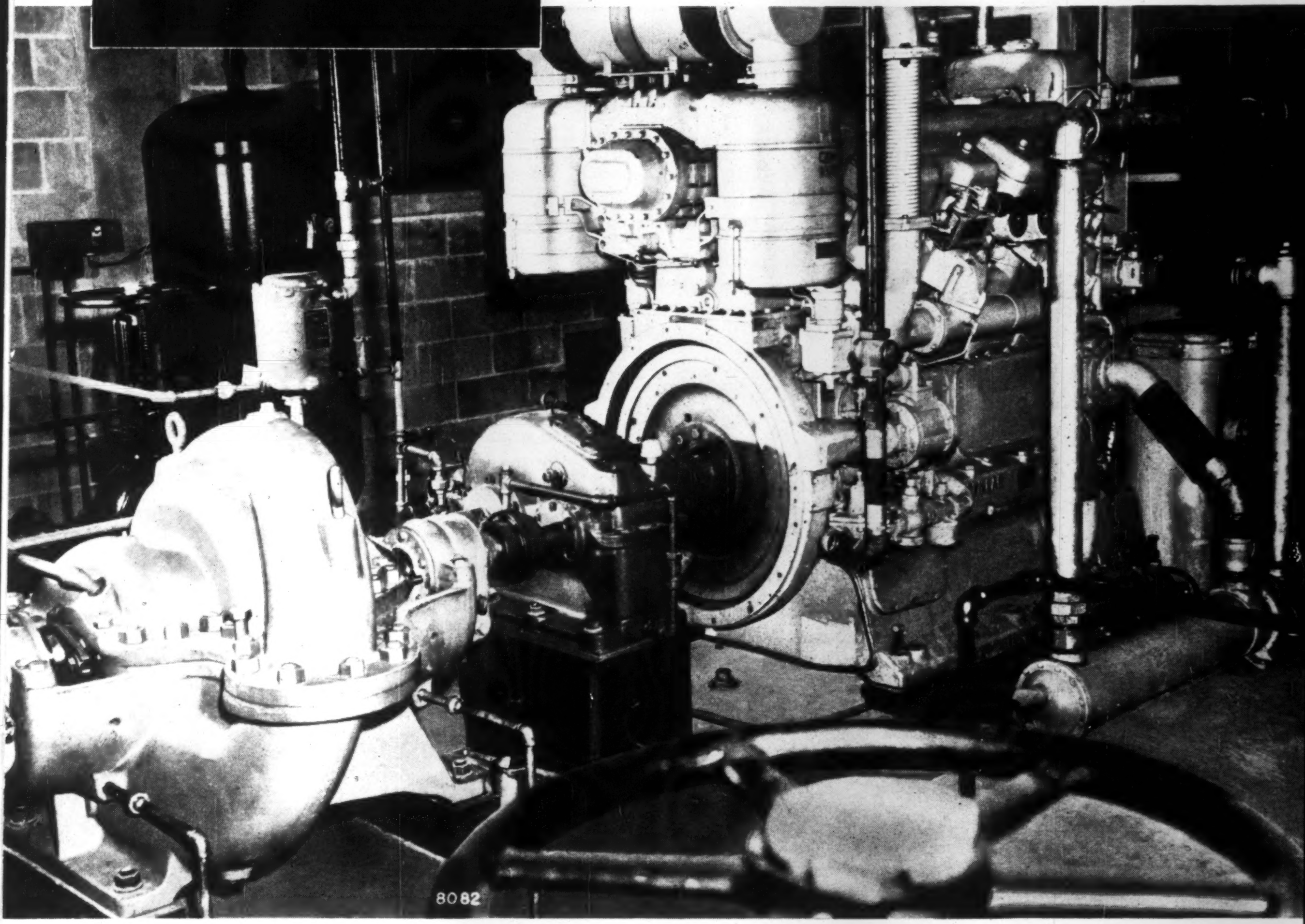
If the air temperature of the rooms is kept at 70 to 72 F, then the steel and the wood of the furniture will assume the same temperature. However, if the human body — at about 100 F — comes into contact with the material, the sensation is different. Steel has a much higher conductivity than wood, consequently the part of the human body which is in contact with the steel transfers its heat much faster to the steel. Therefore, the contact with steel creates a sensation of cold. It is not only a sensation, but the part of the body in contact with the steel actually becomes colder. The body attempts to make the necessary adjustments to overcome the discomfort. Of course, if heavy clothing is used, these differences are minimized.

Therefore, it would seem desirable for all parts of the enclosures, including furniture, school rooms and assembly halls to be made of poor heat conductors.

Paul L. Geiringer
Chief Engineer
American Hydrotherm Corp.
New York

DE LAVAL
TWO-STAGE
CENTRIFUGAL PUMPS

boost pressure at peak loads in Port Washington, New York



This De Laval two-stage horizontal split-case pump is one of a pair used to boost pressure during peak hours in the Port Washington, New York water works. Taking water from a large underground storage tank, these De Laval units maintain pressure throughout the system. The dependable centrifugal pumps are powered by Caterpillar diesels with speed increasers; they deliver 1500 gpm at 400 feet tdh with 15 feet lift requiring 185 bhp.

De Laval 2IS-2KS pumps are designed with • back-to-back impellers for balanced hydraulic thrust • easily replaceable threaded impeller wearing rings • long-life labyrinth case rings • ring-oiled ball bearings—plus ten other important design features. They are available in sizes from 2 inch to 8 inch discharge, for capacities to 3000 gpm and heads to 750 feet. *Write for Bulletin 1501 giving complete data.*

Consulting Engineer
Angus D. Henderson
Westbury, L. I., N. Y.

Contractor
D. Fortunato, Inc.
Floral Park, L. I., N. Y.

DE LAVAL *Centrifugal Pumps*

DE LAVAL STEAM TURBINE COMPANY
871 Nottingham Way, Trenton 2, New Jersey

DL 387

Question of the Month

How Can I Collect from Client?

The Question *How Can I Collect from a Client Who Withholds Final Payment, Claiming His Building's New Air Conditioning System Isn't Performing As It Should?* was asked previously in HPAC, and is repeated here along with some of the answers that have been received from readers. Other answers or comments for publication are invited.

"Our office designed a fine air conditioning system that went into operation last summer. It serves a comparatively small office building occupied entirely by one tenant. The owner is holding back final payment because he maintains the system isn't performing as it should.

"That's where the 'puzzlement' comes, and here's why. The job was designed to hold 78 F dry bulb and 45 percent relative humidity at the outside design conditions of 95 F dry bulb and 75 F wet bulb. We checked the job carefully on a day when the outside temperatures were at the design condition. We were carrying 74 F DB and 50 percent RH inside — well below what the system was designed to do and which the owner understood he would get when the contract was signed.

"Here's the tough part, and I don't know just what to do about it. When I talked with the executive who is holding up payment, he admitted that none of his people had made any complaints about being uncomfortable. However, he said he didn't think the job was working right — and here's why!

" 'That thermostat on my wall shows a setting for 58 degrees,' he told me, 'but when I move it to 58, your system won't drop the temperature below 74.'

"I told him he wouldn't be comfortable if the temperature in his office were anywhere near 58 F, but got nowhere. I explained how thermostats were marked, and why, and that the thermostat itself doesn't create the temperature it controls.

"I suggested that he call in some other consulting engineer of good reputation to survey the installation; if the other consultant says I am right, the owner is to pay his fee but if he says I am wrong, I'll pay it. My offer made no impression.

"So what do I do next, other than to go to court? I'd certainly welcome any help other readers who may have faced as screwy a sales problem as this one can give me."

Delivery Problem, Not Sales Problem; Change Thermostat Reading

THIS IS NOT a sales problem but a delivery problem. The sale has been made.

The thing to do is to say: "I am sorry, we made a mistake and did not know it until you spoke to us about the matter. We have equipped the installation with the wrong thermostat." Then exchange the thermostat with an identical one — that can be snapped on by the consulting engineer himself while he is there, without tools — but which has been sprayed with a nice bronze finish and given a decal dial reading no lower than 74 F.

The moment the consulting engineer has said he was wrong, and implies that the executive is the one who found out, he will be right with that man forever after.

SIEGFRIED RUPPRIGHT
Professional Engineer and Consultant
Inglewood, Calif.

Similar Troubles Caused by Stack Effect And Cross Connected Controls

WHILE not an answer to the question, this case reminds me of a couple of jobs where the air conditioning systems actually weren't performing as desired.

One of the jobs that I had trouble with was due to a stack effect in the building which caused an actual leakage of hot air into the apartment or infiltration of unconditioned air due to pressure build-up in chases normally used for piping that runs vertically through the building. The leaks were finally tied down to small openings around pipes and even a certain amount of "breathing" through a plaster wall.

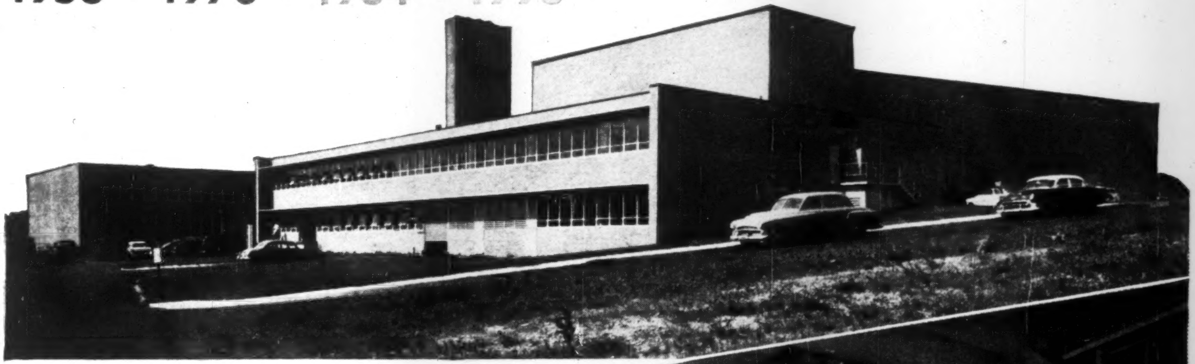
Considerable trouble had finally led to rectifying all possible items, and this is when it was determined that this problem was caused by these apparent leaks. Immediately on their correction, the system pulled down to a 67 F temperature, with the thermostat set as low as possible, and the customer was satisfied.

The particular problem raised in the Question sounds more like the other building we had, where it was actually no more than a control problem that would not permit the compressor to run fully loaded when the temperature approached 72 F. A careful check of the equipment size and analysis of the oper-

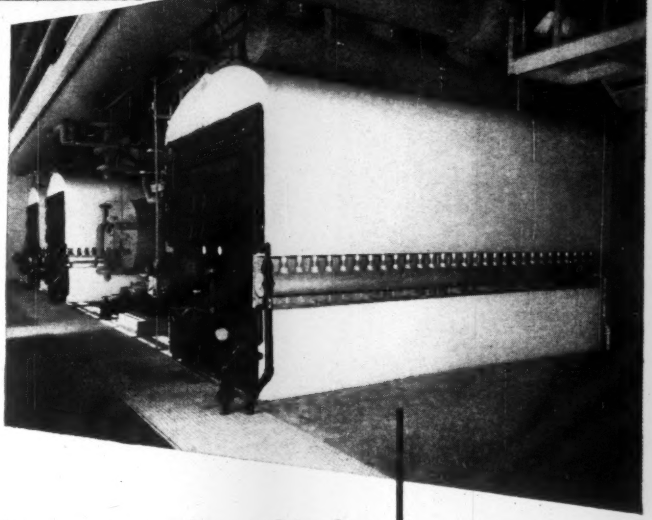
Continued on page 140

JUST ARRIVED!

1956 • 1970 • 1984 • 1998



The Planners of ABINGTON SENIOR HIGH SCHOOL Looked Ahead Three Generations!



These Smith-Mills No. 60-S-30 boilers installed in the Senior High School, Abington, Pa. Joseph Wigmore, Architect; Carl D. Shields, Engineer; American Sanitary Sales & Service Co., Inc., Heating Contractors.

By specifying three No. 60-S-30 oil-fired cast-iron Smith-Mills boilers for the new Senior High School at Abington, Pa., the planners made sure that

> **Students attending today and for the next 20, 30 — even 40 years — will be warm and comfortable.**

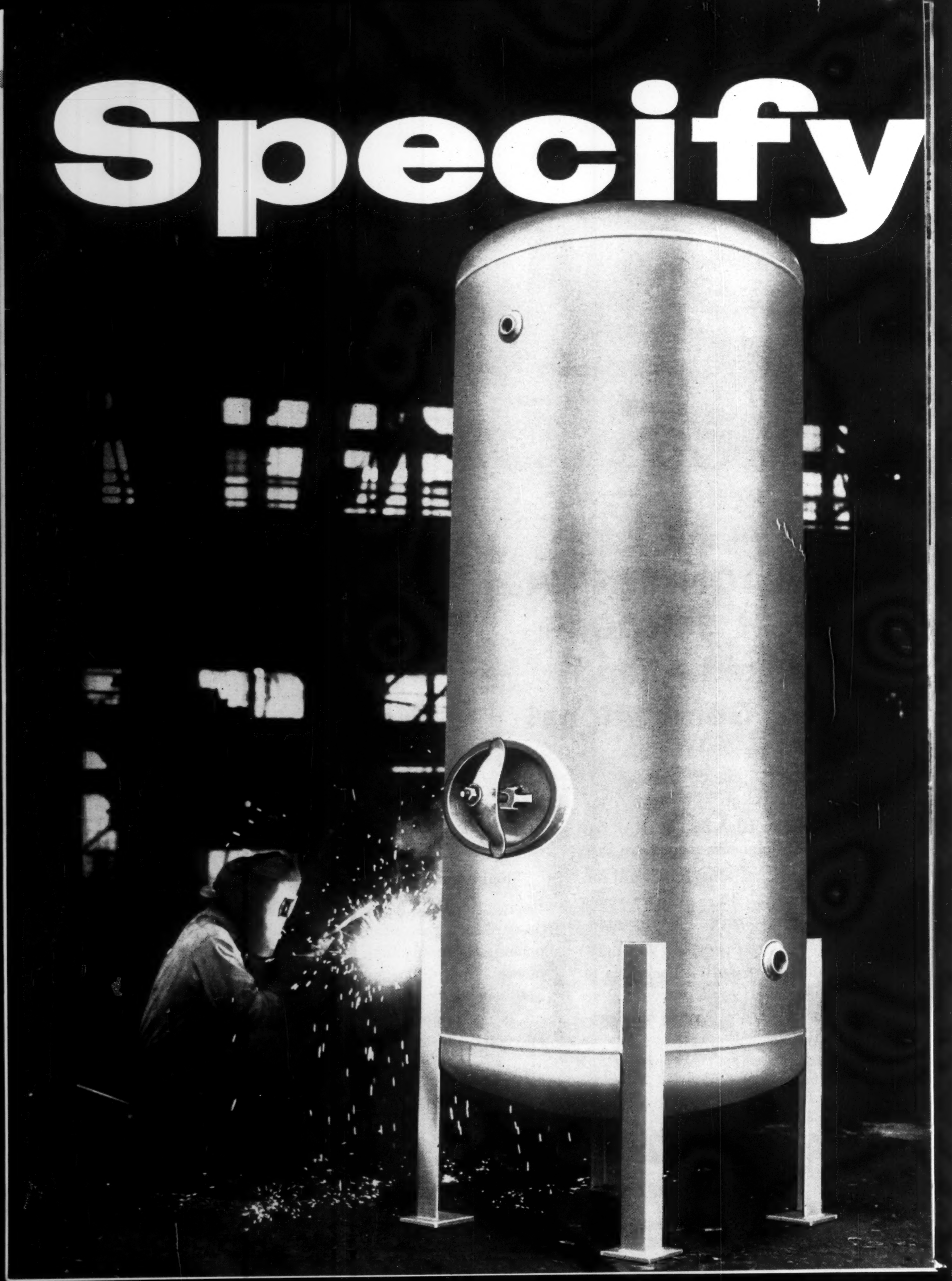
Because cast iron is practically indestructible and virtually impervious to the residual corrosion of combustive gases, it has been proved to have prodigiously long boiler life.

> **The taxpayer, today, and in the years to come, will save in fuel, maintenance and repairs.**

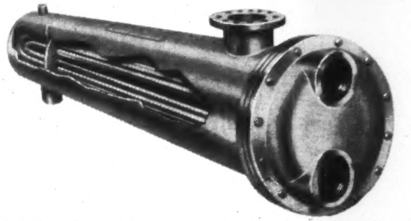
Because the unique H. B. Smith flue design exacts the complete boiler heat potential from any fuel, the full value of every fuel dollar spent is realized. Maintenance cost of Smith-Mills boilers is negligible, even over 40 years and more of service.

H.B. *Smith* CAST IRON BOILERS

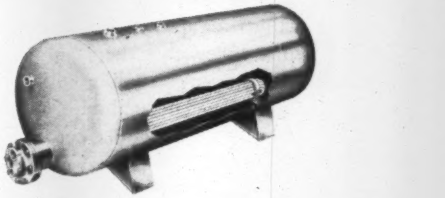
H. B. SMITH CO., INC., WESTFIELD, MASSACHUSETTS • *Established 1853*


Specify

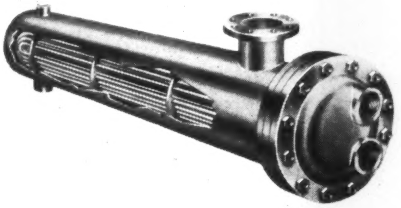
RECO



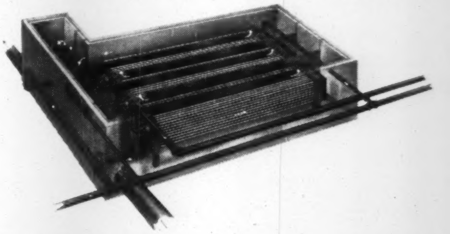
RECO CONVERTORS . . . A shell and tube heater of 2-pass design for use in forced circulation hot water heating systems. Ideal for schools, factories, hospitals, apartments, etc. Heating is by steam in shell, water in tubes. Removable heating elements are of seamless U-bend tubes to eliminate internal joints and expansion stresses. Write RECO for free catalog.



RECO HOT WATER STORAGE HEATERS . . . Horizontal and vertical types. Designed for installations requiring large quantities of hot water at irregular intervals. Hot water reserve is held to meet peak demands. Steady recovery in low demand periods keeps boiler load constant. Removable heating elements are of seamless copper U-bend tubes. Shells available in variety of materials, coatings and linings.



RECO INSTANTANEOUS HEATERS . . . A shell and tube heater of multiple pass design for use where a continuous supply of hot water is desired and where the steam supply is adequate for peak loads. Live steam in shell used to heat water or other liquids. Can be connected to circulate through RECO storage tanks. Write RECO for full details.



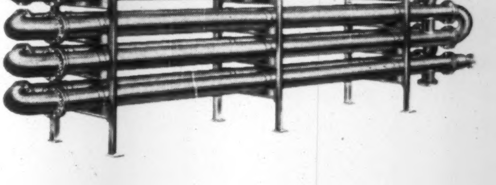
RECO HEAT RECLAIMERS (Pit Type) Ideal for reclaiming waste hot water solutions to pre-heat cool liquids. Hot waste water flows by gravity through pit and around submerged tube bundles. Incoming liquid in tubes absorbs heat. Complete, baffle-controlled counter flow gives maximum heat transfer and recovery. Write RECO today for free catalog.

Forty-three years, and thousands of installations throughout the world testify to RECO's skill in building the best in water heating equipment.

You can rely on RECO to meet your maximum specifications for economy and guaranteed performance. Leading engineers, contractors and architects everywhere specify the full RECO line of Hot Water Storage Heaters, Tanks, Convertors, Instantaneous Heaters and Heat Reclaimers.

Make the RECO guarantee of top quality, quick delivery and fair price part of your next heating job. SPECIFY RECO.

Write today for free catalogs plus the name of the RECO representative nearest to you: Dept. L, Richmond Engineering Co., Inc., 7th & Hospital Streets, Richmond, Virginia.



RECO HEAT RECLAIMERS (Closed Type) Serve same purpose as Pit Type—Utilizes waste heat to pre-heat cool liquids. This reduces fuel consumption and operating costs. Closed type Reclaimer ideal where space is tight. Waste water pumped through tubes arranged in series. Incoming liquid circulates through shell. Write RECO for full details.

RICHMOND ENGINEERING CO., INC.

Continued from page 136

ating conditions of all components showed that the humidity control in conjunction with an outside temperature controller was cross connected, so that we actually ended up with a limitation that was certainly not related to the inside temperature. This problem was corrected, and the system was then able to pull the temperature down within the space.

The only other conceivable point that crosses our minds in connection with the reader's dilemma is the actual reduction in capacity of the air conditioning system when it approaches the 72 F point, due to a lack of adequate temperature differential, if the system was actually designed to maintain approximately 78 F inside. This may be possible because a careful analysis will show that under normal conditions 60 to 70 percent of the load in the building, even at 90 F outside, is comprised of an internal load. This internal load of course does not vary with the outside temperature; therefore, if the system could be checked when the outside temperature was at 74 F, it would undoubtedly be found that the largest factor in the load had not been materially altered.

LEE C. GATEWOOD
Vice President and General Manager
Air-A-Therm Corp.
Philadelphia

Educate Client in Fundamentals; Show Capacity Is 13 Percent Above Specs

MOST OF US in the profession would agree that the problem is not mechanical, but rather one of acquainting an executive with fundamentals with which he appears not to be on very familiar terms.

1) The client employed a consultant to design a system to meet a given specification, namely to reduce atmospheric conditions within his building from an outside condition of 95 F dry bulb and 75 F wet bulb down to 78 F DB and 63.5 F WB. Based upon such a design, a contract was entered into to furnish and install equipment to accomplish this purpose.

2) The total heat of 1 lb of air is directly proportional to its wet bulb temperature. One lb of air at outside conditions has a heat content of 38.6 Btu, and the same pound at the specified interior conditions would have a heat content of 28.9 Btu. The load requirement for the equipment required would then be based upon the quantity of outside air used and the temperature gains due to the building and its occupants.

For the sake of this problem let us designate the load as equivalent to 1000 lb of air reduced from outside to inside conditions each minute. To accomplish this specific loading would require equipment with a capacity to remove 1000 × (38.6 − 28.9) = 9700 Btu per min.

Now, in order to reduce this same 1000 lb per min of air to a temperature of 58 F — even if saturated — would require equipment of different capacity, since the heat content of air at this temperature could not possibly be greater than 25.15 Btu per lb. This difference in air temperature alone would require a capacity to remove 1000 × (38.6 − 25.15) = 13,450 Btu per min.

But the problem does not end there. When the interior temperature is lowered to 58 F instead of 78 F, the temperature difference between inside and outside is increased and the building gain thereby increased 117 percent, or 217 percent of contracted loading. In order to satisfy this additional building load, more air will be required and more fan and cooling capacity are then necessary. Assuming a direct relationship, 217 percent of 1000 lb per min = 2170 lb per min. This quantity of air × the heat change per lb (38.6 − 25.15) = 29,186 Btu per min, or an increase to 300 percent of capacity contracted for.

As far as this job is concerned the thermostat has nothing whatever to do with the thermometer that may be attached to it or with one elsewhere in the building. The owner contracted for equipment designed to fulfill conditions which normally are specified as part of the contract. If on a design day — outside conditions equal to 95 F DB and 75 F WB — the equipment satisfies the specified interior conditions, the consultant has discharged his obligations and is entitled to full payment therefor. The fact that a pilot control — installed to automatically maintain specified conditions — does not regulate the equipment provided to new conditions beyond specified limits, does not substantiate proper or improper operation.

3) If the owner really wants a 58 F temperature, he would have to buy approximately three times as much plant as he apparently has contracted for. He already has over 13 percent more capacity than specified in reaching the 74 F temperature mentioned.

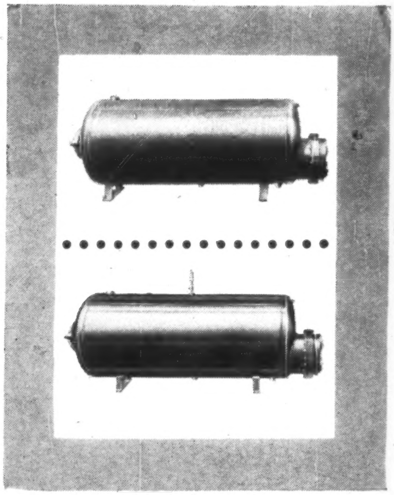
K. R. GODDARD
Thomas and Hutton and Associates
Architects and Engineers
Savannah, Ga.

"What's the Correct Way to Trap Steam Headers, Tracing Lines?"

"We have been having considerable discussion as to the correct method of trapping steam headers and steam tracing lines, and we would like to know if others have some suggestions.

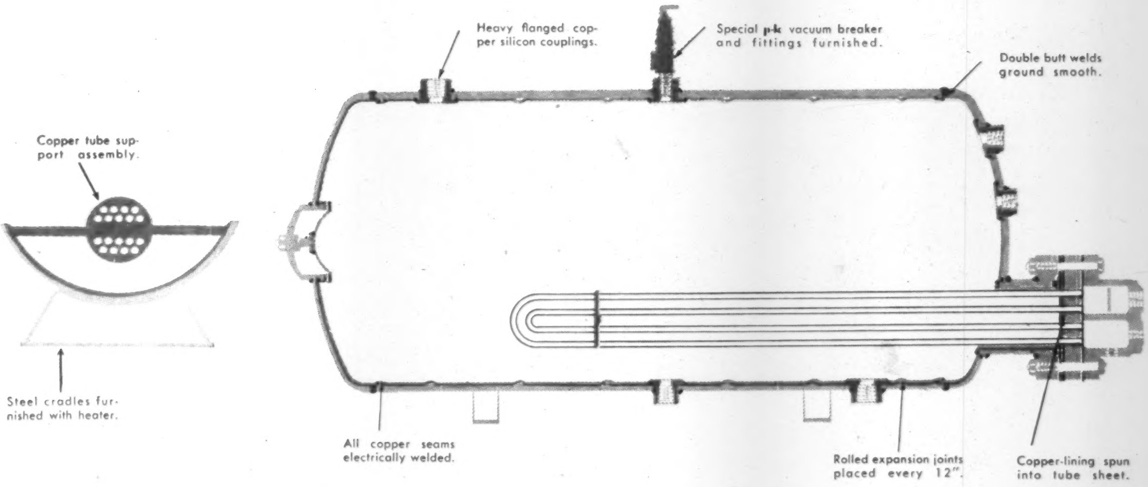
"We are confronted with determining the correct distance between traps on a steam header or on steam tracing lines. Steam pressures will vary from 2 psi to 400 psi and the tracing line sizes are from ½ in. to 2 in. in diameter. These installations will be in various parts of the country from Louisiana to Canada"—E.R.E.

• *YOU ARE INVITED to contribute a question for publication or an answer to a published question. Write: The Editors, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2.*



WHICH OF THESE Copper-Lined HEATERS WOULD YOU SPECIFY?

ONLY ONE has all these features


Heavy flanged copper silicon couplings.
Special p-k vacuum breaker and fittings furnished.
Double butt welds ground smooth.
Copper tube support assembly.
Steel cradles furnished with heater.
All copper seams electrically welded.
Rolled expansion joints placed every 12".
Copper-lining spun into tube sheet.

Like twins, copper-lined heaters can look pretty much alike—on the outside. But *inside,* and on key points of construction, they can be as different as day and night.

Engineers experienced in copper-lined heaters are aware of these vital differences and specify accordingly.

They insist, for instance, on rolled joints every 12 inches around the full circumference of the lining to allow for longitudinal expansion . . . on the copper-lining being not less than 3 lb. per square foot . . . on heavy flanged copper silicon couplings, welded to both the shell and the lining . . . on enough tube supports . . . on an adequately long tube bundle with parallel "U" bends . . . and on a vacuum breaker valve to protect the lining from sudden pressure fluctuation. They make sure that separate hydrostatic and pneumatic tests are run to guarantee that linings will be leakproof.

These experts specify these details, and others, found only in P-K heaters, because they know that heaters built *without* such safeguards are false economy; but that heaters "built right," like P-K's "Indestructo" copper-lined heaters, assure trouble-free service year after year.

Like the full story? We've detailed the key construction features in sample specifications and in P-K's new Catalog 19. Ask your local P-K representative for copies or write today.

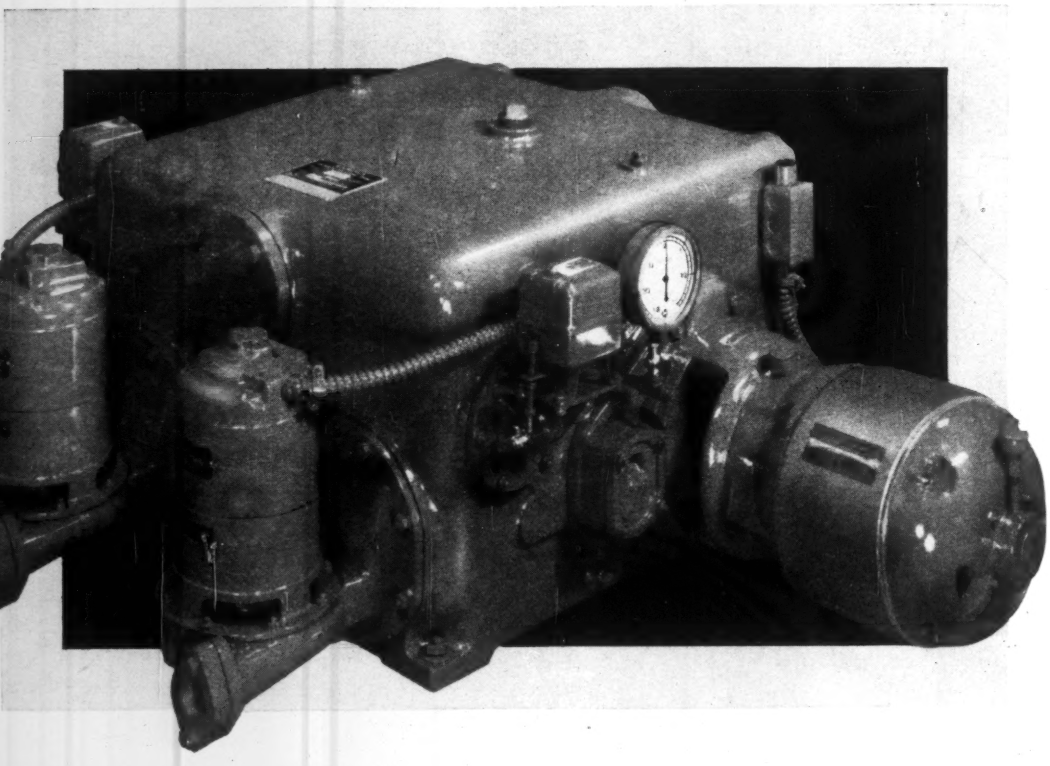
The Patterson-Kelley Co., Inc., 710 Burson Street, East Stroudsburg, Pa.

Patterson Kelley

2598

storage water heaters • instantaneous heaters • convertors • fuel oil heaters • freon chillers and condensers

THIS NEW VACUUM HEATING PUMP IS SIZED TO ACTUAL JOB REQUIREMENTS



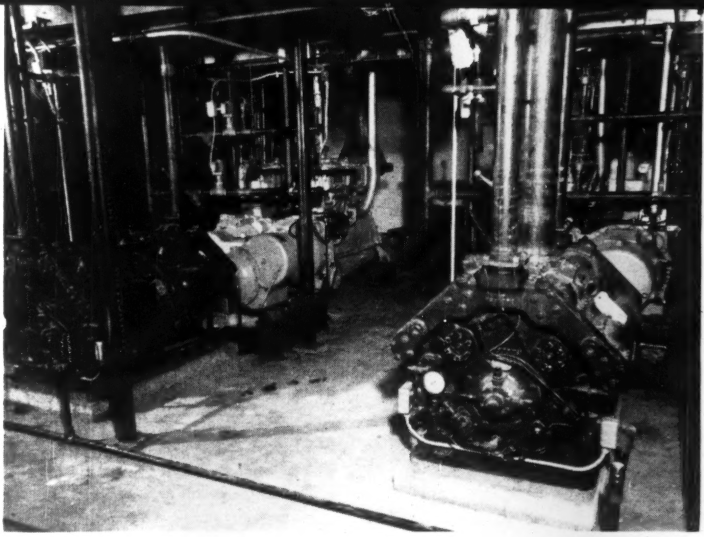
It's the Nash CSM

No longer is it necessary for the Engineer to accept a vacuum heating pump with air and water capacities based inflexibly upon square feet of equivalent direct radiation. With the flexible Nash CSM he can provide for proper air capacity in accordance with his judgment and experience. For the individual capacities of the separate pumps on the CSM may be varied within a wide range, without buying an oversize receiver and oversize water pumps.

These pumps possess many other features which permit a more efficient utilization of fuel and minimum use of electric power. Low, low, returns reduce installation costs and usually eliminate putting the pump in a pit. Simplicity and efficient operation reduce supervision and maintenance costs. Information regarding this new heating pump development is available immediately upon request.

- ✓ **Increased air capacity induces rapid system response without wasteful overheating.**
- ✓ **Separate air and water pumps individually selected to meet actual job requirements.**
- ✓ **Control system that operates individual pumps only when needed.**
- ✓ **Flexibility permitting addition of radiation without changing basic pump installation.**
- ✓ **Low, low, return line connection.**

NASH ENGINEERING COMPANY
438 WILSON, SO. NORWALK, CONN.



Suzy HATS
Fanny Farmer CANDIES

600 Ton Heat Pump System Creates “Eternal Spring” in Shopping Center

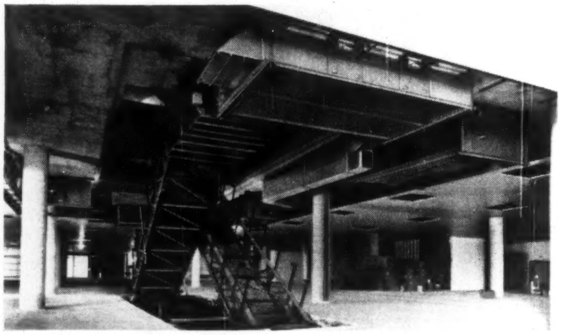
The new $20 million Southdale regional shopping center in suburban Minneapolis is the first such center under one roof, completely air conditioned, and with a unique outdoor character. "By bringing the outdoors indoors," says Victor Gruen, architect, "we are creating a new kind of environment — one of Eternal Spring."

A WELL WATER HEAT PUMP SYSTEM of 600 tons cooling capacity, in combination with package air conditioning units totaling 700 tons, maintains a constant 75 F temperature throughout the Southdale shopping center, Minneapolis. Total refrigeration capacity is 2200 tons.

The center consists of approximately 70 retail stores having a total internal area of 675,000 sq ft, of which approximately 25 percent is stock area and the remaining 75 percent is sales space. The largest individual store is Dayton's department store, having a total area of approximately 180,000 sq ft.

The second largest store is Donaldson's department store, having a total area of approximately 160,000 sq

OUTSIDE AIR MAKEUP UNITS — one of two shown — supply air to garden court. Drums contain ethylene glycol used in preheating coils.



FIVE AIR CONDITIONING UNITS are installed at escalator shafts on each floor in Dayton's department store. A 70 F temperature is maintained in this store

. . . garden court serves

THROUGH LARGE OPENING outside air is introduced into distribution plenum. Plenum extends the length of the court and distributes conditioned air into it

NARROW HORIZONTAL SLOT, left, opposite air intake, channels conditioned air from distribution plenum into garden court

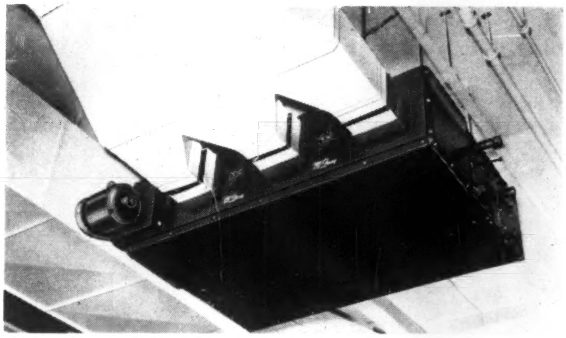
ft. Although Donaldson's is completely integrated with the shopping center in an architectural sense, it is in all other respects independent, including mechanical ventilation, air conditioning, and heating systems, which are separate from the balance of the shopping center. The following therefore applies to all stores in the shopping center, except Donaldson's.

In effect, the shopping center is a single, three floor structure having a basement, lower level, and upper level. Entrance to the center is through five broad arcades from the lower level parking lot to the floor of the interior garden court, plus five additional arcades which lead from the upper level parking lot to the mezzanine balcony of the garden court. The entire shopping center, including the garden court, is air conditioned throughout the entire year.

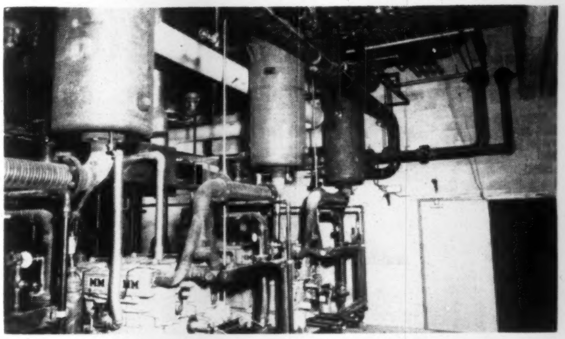
The heavy mechanical equipment for heating and cooling is, for the most part, in a penthouse above the roof of the main structure. The interior garden court is treated as an outdoor area and two supply fans in the penthouse discharge a maximum of 120,000 cfm of air into this space from the outside. This outside air is precooled during the summer time and preheated during the winter to maintain a temperature of 75 F within the court.

Ventilation air to Dayton's store is delivered from the garden court by separate fan in the penthouse. Ventilation air for the other stores is provided by operation of six large fans in the basement of the center. These fans exhaust air from the tenant stores which in turn induces outdoor air from the garden court to enter the stores through long slots located above the store fronts. The air from the six basement exhaust fans is discharged into various stock room areas in the basement level.

The basement level also contains a large truck tunnel which permits free loading and unloading merchandise both during active sales hours and when the shopping center is shut down. The air previously discharged into the basement stock areas is drawn into the truck tunnel and then exhausted by a single fan in the penthouse.



HEATING UNITS are suspended in the ceiling along the perimeter to compensate for heat loss near glass areas and at roof level in the Dayton store



EXHAUST GAS MUFFLERS are water cooled on these natural gas engines, which are direct connected to compressors. Heat is removed from exhaust for heat pump system

as a giant plenum for the air conditioning system

Differential static pressure regulators operating automatic dampers and inlet vanes on all fans insure the proper direction of air flow at all times.

Natural Gas Engines Drive Compressors

Cooling for Dayton's store is accomplished by a central chilled water refrigeration plant in the penthouse, and having a capacity of 700 tons on the cooling cycle. This plant consists of five 16 cylinder compressors, each direct connected to a natural gas internal combustion engine, plus two 28 in. × 12 ft condensers and two 36 in. × 12 ft flooded type water coolers. A recirculation water system distributes the chilled water from this plant to air units located within the interior of Dayton's store.

Air conditioning for the remaining tenant stores in the center is provided by 2 to 15 ton package units.

Water cooled condensers are used in all package units, and they are tied into a recirculation system which provides condenser water whether the unit operates or not.

Well water at 50 F is used to precool the total amount of outside air delivered into the garden court. About 600 tons of refrigeration is done with well water.

During winter operation the two major heating load requirements are that of tempering the outside air introduced into the garden court and off-setting the transmission losses through the perimeter and roof of the total building structure. The heat for both of these purposes is supplied from the central refrigeration plant used to cool Dayton's store. This system operates as a heat pump, with the heat rejected from the condensers being supplemented by heat from water cooled exhaust gas mufflers and the heat generated in the gas engine jackets.

A condenser water recirculation system delivers the heated water from the refrigeration heat pump to various air units with water coils around the perimeter of the project which offset the perimeter heat losses. The hot water from the heat pump is also circulated through the well water cooling coils of the two large garden court supply units to provide a portion of the heat for ventilation air. To prevent freeze-up of these coils during subfreezing outside temperatures, ethylene glycol preheat coils are installed in the air streams preceding the water coils.

Air Flow Rate Reduced in Winter

During winter operation of the heat pump cycle, the maximum condenser water temperature will be approximately 130 F. During extremely cold outside weather conditions, the capacity of this heat pump is not sufficient to heat the entire 120,000 cfm of ventilation air, and the quantity of outside air introduced into the garden court is reduced during these periods.

Outside air is not used for cooling any of the stores during winter operation, and the mechanical refrigeration system must serve this purpose. Under these conditions, the heat pump serves to transfer the heat generated within the interior area of the Dayton's store to heat the ventilation air and off-set perimeter heat losses.

During these periods 52 F well water is bled into the refrigeration system water coolers to produce an artificial load if the heating requirements are greater than the cooling requirements. If the cooling requirements are greater, then the 52 F well water is bled into the refrigeration condensers to dissipate the surplus heat of rejection. Provision has also been made to utilize available condenser heat from the package units.

At −20 F outside this heat pump will make available for heating 1.37 Btu of heat energy for every Btu of energy supplied to the gas engines in the form of natural gas. At −10 F the efficiency is slightly improved and the heat pump will produce 1.45 Btu of heat energy for each Btu of energy supplied.

The heating, piping and air conditioning contractor was Reuben L. Anderson-Cherne, Inc. York Corp. installed portions of the air conditioning system. ‡

Photos courtesy McQuay, Inc., and the York Corp.

1957: The Boom Rolls On

. . . general business activity seen 3.7 percent higher than last year

- new construction will reach $46.4 billion
- production of coal, oil, and gas to rise
- demand for complete central air conditioning to grow
- water rates and restrictions will increase
- new materials and methods to be used in equipment

EXPANSION *of the U.S. economy is expected to continue in 1957, with an increase of about $15 billion in gross national product to $425 billion, 3.7 percent higher than in 1956.*

During the first half of the year general business activity will be at a higher level than in the comparable 1956 period, economists predict. A plateau may be reached late in the year, but no marked downturn is seen.

Full employment, rising wages, expanding markets, and higher prices are some of the factors seen in this period of the boom. Inflation will account for some of the increase in the dollar volume, but the consensus is that the "tight" money situation will avoid runaway inflation.

Two notes of caution are sounded by the forecasters: (1) the decreasing availability of credit and (2) the grim international situation.

For a closer look at what 1957 has in store for the heating, piping, and air conditioning field, HPAC presents the following facts and opinions as expressed by several authorities in this field.

Water Rules Spur Towers

"THE YEAR 1957 will see the greatest expansion of cooling tower business in connection with air conditioning installations of any single year of record," predicts Raymond C. Kelly, executive manager of the Cooling Tower Institute.

"With increasing attention devoted to water conservation procedures, many municipalities will draft and enforce local regulations requiring the installations of cooling towers for operation on air conditioning, refrigeration, and process plants," he says.

NEW AIR CONDITIONED office building will be home office of Mutual Benefit Life Insurance Co., Newark, N. J.

Also, new materials of construction and new combinations of conventional materials of construction will find application in cooling towers during 1957, Mr. Kelly says. "At an accelerating rate treated lumber is displacing untreated redwood as the principal structural material. Compliance with fire ordinances brings greater use of asbestos-cement panels for exterior surfaces. And more of the corrosion resistant materials like monel metal, stainless steel, and aluminum, will be brought into the competitive picture by improved fabricating techniques."

Regarding water regulations, Mr. Kelly says, "Even in those cities in which water supplies are adequate and no water conservation regulations are contemplated, it is probable that water rates will be gradually

(Continued on page 149)

Record Construction Levels to Continue in 1957

. . . outlook is $46.4 billion total

OUTLAYS for new construction are expected to total $16.1 billion in 1957, about 5 percent above the record volume of more than $11 billion for 1956, according to the U. S. Depts. of Commerce and Labor.

Some expansion is likely in the coming year in most major types of construction, except new private housing. Because of the housing decline, private construction as a whole is expected to show only a nominal increase over the 1956 level, reaching $31.4 billion in 1957. Public construction outlays will probably rise a substantial 12 percent, to $15 billion. Physical volume — expenditures adjusted for price changes — also may be up slightly from 1956, and will about equal the record set in 1955.

The forecast is based on the assumption that the general economic level will advance moderately, with employment continuing at record levels, and personal income reaching a new high. It was assumed also that international developments will not significantly affect construction in the U. S. this year.

Construction costs are expected to continue to rise, but at a rate slightly lower than in 1956. Building materials should be in adequate supply, with no more than minor spot shortages likely, because of extensive gains in plant capacity and record production levels.

Mortgage funds, however, will probably continue to be relatively scarce, especially for long-term, low down payment loans, reflecting widespread competition for credit to meet the unusually large demands of businesses, governmental units, and individual consumers in a record breaking economy.

- Most of the gain in private construction is anticipated from increased construction by the public utilities, and advances in all types of new nonresidential building except commercial building, which is expected to remain unchanged.

Announced expansion programs suggest unprecedented expenditures in 1957 of about $5¾ billion on privately owned public utilities. The most significant dollar gains among the utilities will probably occur in natural gas pipe lines and electric power facilities.

- Private industrial plant construction will continue to expand in 1957, but at a much slower rate than during the past 2 years. This reflects in part the fulfillment of capacity goals in some industries and some revision of expansion programs in others. The $3.2 billion expected to be put in place on industrial buildings will be an alltime high, exceeding 1956 volume by 5 percent and 1955 by 33 percent.
- Outlays for commercial buildings will probably total $3.3 billion, with an increase for office buildings offsetting a decline in expenditures for new stores and other mercantile buildings. Demand for additional office space is still high. But declining contract awards volume and the completion of many new shopping centers suggest that store building demand is beginning to taper off.
- Religious and private educational building — each topping any previous year in 1956 — will likely expand still more in 1957.
- The expected increase in public construction reflects mainly continued expansion in all types of state and local public works, especially schools, and sewer and water facilities. A backlog still exists, despite rising expenditures in recent years.

Record expenditures of nearly $2.9 billion for public school building appear likely in 1957.

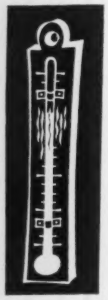
- Public and private hospital building — in a decline since 1954 — may show an upturn, reflecting in part increasing federal aid. Nevertheless outlays will not reach the 1950-52 levels.
- Construction at military bases is scheduled for another moderate advance in 1957, and will be at a postwar high. Outlays for public housing will show the first significant expansion since 1951, primarily because of the new federal program of military housing under Title VIII of the National Housing Act.

How Much Air Conditioning in 1957?

. . . installed cost of central systems over 25 tons will soar to about $450 million

BY GEORGE S. JONES, JR.

Managing Director
Air-Conditioning and
Refrigeration Institute



AIR CONDITIONING will have its best year to date in 1957. All records will be broken in equipment sales and in installations of all types.

• More large hotels are planning air conditioning installations in 1957, following literally hundreds in 1956. A survey late in 1956 revealed that New York hotels alone had about 13,000 air conditioned rooms. With other cities following that lead, the market for hotel air conditioning in virtually every American city is expected to surpass the 1956 level.

• All new office buildings are being constructed either with air conditioning installed or with provision for it later. Conversions of old buildings to air conditioning are expected to continue at the same or higher rate.

Leading the trend toward air conditioning of office space is the federal government. It is doubtful if the government will ever build another office building anywhere in the country without air conditioning. One report received by the General Services Administration, housekeeping branch of the federal establishment, shows that an air conditioned building can be built at a lower cost per square foot of usable space than a building without air conditioning.

• In the hospital field, a report by an official of the U. S. Public Health Service to be published this year points out the therapeutic benefits of air conditioning to hospital patients. Late in 1956 a heart specialist declared that air conditioning is beneficial for cardiac patients and said that this also aids the healthy man. These and other pronouncements by authorities are expected to lead hospital administrations throughout the country to speed up air conditioning.

It is estimated that at the present time only 5 percent of existing hospitals are completely air conditioned — although a larger number have partial air conditioning — and that about half of new hospitals on planning boards will be completely air conditioned.

• Factory air conditioning, on the increase during the past several years, is due for a big upsurge in 1957 and the next few years. Industrial air conditioning for employee comfort — completely aside from climatic control necessary for many processes — is developing faster than anyone thought it would, according to a survey last year by The Trane Co.

Engineers and architects surveyed predicted that 75 percent of new factories, and 50 percent of all factories, in the South will be air conditioned by 1960. Factories in the North, particularly those involving high skills, are either air conditioned now or are planning for it in the future.

• While results may not be felt during 1957, research at the new Purdue university research center on refrigeration, air conditioning, and environmental physiology will guide many future customers for air conditioning, not only in the field of human comfort but in areas involving more efficient livestock production and other farm functions.

• Accurate statistical information in many air conditioning areas is not available for 1956 at this time. But an indication of the magnitude of just one phase of the industry is to be found in the "installed cost" figures of central station air conditioning systems over the past six years:

	Thousands
1950	$241,770
1951	278,200
1952	252,920
1953	295,040
1954	378,810
1955	389,020

• Actual cost of compressors, condensing units, absorption and adsorption systems, and centrifugal systems of 25 hp and over is estimated at about 10 percent of the installed value of a central station system. The remainder includes labor, ducts, controls, insulation, and all other installation costs — about $350 million in 1955. On the basis of past performance, it seems safe to forecast that the 1956 installed cost figure will be in the neighborhood of $400 million, with about $360 million going to the contractors and installers, who may get about $400 million out of a $440 or $450 million total in 1957, if the present trend continues.

(*Continued from page 146*)

increased and thereby justify the economic installation of water conservation equipment. This applies particularly in the eastern U.S. which, for generations, have been considered water surplus areas. Combining the increase in per capita consumption of water with the increase in new uses of water, the demand for water will exceed the immediately available supply, and the result will be either cost increases or local regulation of use.

"Expansion of water distribution systems, improvement in water treating procedures and installation of water reclamation plants will not be completed in time to prevent general rises in water costs and more frequent adoption of water regulations.

"In 1957 there will be an increase in installations of centralized plants for air conditioning systems, such as for multi-building hospitals, schools, and institutions, shopping centers, and integrated commercial developments. In these cooling water will be supplied as a utility just like electricity, gas, and water. It will be cooled in a central cooling tower and distributed to the separate air conditioning and refrigeration condensers on a 'gallon-degree' basis. This will reduce the number of small cooling towers with their attendant motors, pumps, piping, and valves, and will concentrate the cooling load in a single, large tower remote from the condensers but connected, probably, by a cold water circulating system which will provide adequate cold water for efficient operation of the refrigeration mechanisms."

Expand Indoor Control

Designers of future buildings must consider and provide for control of all the physiological and psychological facts that influence "how people feel," according to E. F. Snyder, supervisor of product application for Minneapolis-Honeywell Regulator Co.

He points out that research into the automatic control of temperature shows that the indoor "environment" most comfortable in a home is not necessarily the one that best promotes effective learning, high worker productivity, or speediest recovery by patients in a hospital.

Already indoor temperature can be automatically adjusted according to activities of a class, the work being done by a group of people, or the health of a hospital patient.

Control of indoor lighting that automatically adjusts to changing outdoor light conditions, and control of other unregulated factors such as ionization of the air, radiant energy, color, and noise may be next, he says.

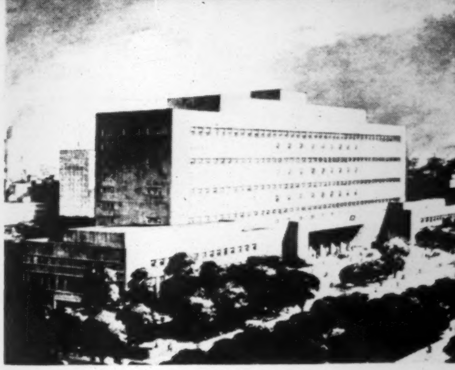
Liquid Cooling Gains

Conditions in the boiler and radiator industry, in the personal opinion of R. E. Ferry, general manager of the Institute of Boiler and Radiator Manufacturers, "will be favorable, with some increase over 1956 likely."

"The anticipated volume for heating and cooling for all types of buildings depends largely on the volume of building starts and modernization work," says Mr. Ferry. "While the building starts for the first nine months of 1956 were off approximately 15 percent from the corresponding period during 1955, the volume for 1957 based on Government forecasts should be rather favorable as compared to 1956, subject only to the decisions of the Federal Reserve Board on the 'tight money' question."

Mr. Ferry anticipates that the demand for liquid cooling systems will substantially increase in 1957. The Institute plans to develop testing and rating codes for year 'round equipment which involves liquid heating and cooling. A start has already been made in that direction as applied to fan-coil units.

As for 1956, the number of cast iron boilers shipped during the first nine months of 1956 was slightly over the first nine months of 1955, he said. In the same period, cast iron baseboards showed an increase of 16 percent and baseboards of all types an increase of 3 percent. The increase in commercial finned tube type of radiation was 16 percent.



NEW SUPREME COURT BUILDING, civic center area, Brooklyn, 12 stories high, will be air conditioned by a perimeter system

Steam Up for Cooling

Optimism for 1957 is expressed by Paul A. West, president of the Steam Heating Equipment Manufacturers' Association.

This outlook, he says, is based partly on the increasing use of steam in the air conditioning field, as well as its use for space heating and process work.

Outlining the applications of steam is a brochure published by the SHEMA, "What You Should Know About Modern Steam Heating . . . When and How to Use and Specify It." Copies may be obtained upon request from the Association, 3738 North Holton St., Milwaukee 12, Wis.

Raise Warm Air Standards

"Prospects for a high volume of business and reasonable profits in the warm air heating and air conditioning industry have never been greater," comments George Boeddner, managing director, National Warm Air Heating and Air Conditioning Association.

"1957 should and can be our greatest year if we have as our basic objective a real service to the consumers and users of our comfort systems.

"Price cutting is not in the interests of the consumer and user, and

(*Continued on page* 151)

Fuel Industries 'Haven't Seen Anything Yet'

. . . fuel and power consumption to double in next 20 years

BY CLYDE WILLIAMS
President and Director
Battelle Memorial Institute

None of the fuel industries in the U. S. has "seen anything yet" in the way of demand for products and services. The two main factors supporting this rising demand are the growing population and the rising standard of living.

Recently the U. S. Bureau of Census forecast a population of over 228 million in 1975. But a straight projection of the present trend indicates 243 million in 1975.

This 50 percent increase, if standards of living remained static, would mean a 50 percent increase in fuel consumption by 1975. But standards of living will increase substantially in the next 20 years. Gross national product should reach about $870 billion — 1955 dollars — by 1975. This is more than double the present estimated GNP of $414 billion. If the standard of living rises one-third, as it would under these circumstances, the per capita consumption of fuel and power should be one-third higher, excepting any gains in efficiency in the use of fuels. Thus, by 1975, the increased consumption would be 50 percent due to higher standard of living, and 50 percent due to increased population. This would mean a doubling of fuel and power consumption in 20 years!

- From 1957 on, coal consumption will resume a trend upward, something like it had before 1920. The projected output by 1975 is 1 billion tons.

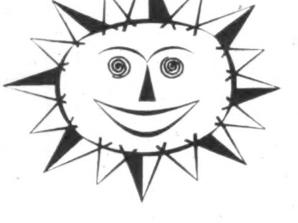
Exports of coal, while only a fraction of total production, at present tend to boost the growth curve significantly. In 1956, 42 million tons were exported, compared to 25 million tons in 1955. Important factors are the further upsurge of industry in Europe, and the likelihood that it will continue, and increased industrialization in South America and other sections of the world.

The demand for coal should be particularly great in electric power generation. Moreover, technological advancement will make coal more competitive, especially among large tonnage users. In addition, new developments in coal fired gas turbines and other methods of utilization give promise of a better place for coal.

- Owing to their highly desirable physical forms, petroleum and gas fit into the new technology admirably.

Crude oil output in the U.S. coincides almostly exactly with that of GNP. The long term trend in the consumption of petroleum products, however, is much greater, the difference being made up by imports.

The consumption of natural gas has been growing considerably faster than the economy as a whole. The growing use of this fuel in industry indicates increasing demand for a long time to come in gas-served areas.



The problems of the petroleum and natural gas industries in the future will be those of providing sufficient supplies rather than of finding markets. Technological advancement will help solve these problems. Eventually, synthetic liquid fuels and fuel gas manufactured from coal and shale will play significant roles in supplying the demand.

- A fourth fuel, uranium, can be converted through fission into a useful source of heat and power.

The present known supplies of this metal appear ample.

Much progress is being made in the development of nuclear reactors and the construction of several major nuclear power plants. The time may not be too distant when nuclear generating plants will be economical in supplementing present fuels to help meet increasing demands. Then, when the conventional fuels become scarce or too expensive, energy from uranium or thorium — or even from fusion of the atom — may supply much of our heat and power.

- Meantime, research on solar energy is being speeded. For example, electricity may soon be generated directly from the sun. Furnaces based on reflection of solar energy are now available for various uses. One disadvantage now facing the use of solar energy is that no practical method is available for storing power when the sun is not shining.

Thus, the potentialities for all fuels are great. Obviously, however, a global war could upset the projected future.

(*Continued from page 149*)

it results in insufficient systems that provide discomfort, inconvenience, and high operating costs," he said.

Oil to Have Banner Year

"THERE is every indication that 1957 should be a banner year for the industrial-commercial oil burner market," says R. H. L. Becker, managing director, Oil Heat Institute of America.

"Estimates for 1957 are most optimistic for both private and public construction.

"In addition, the big replacement market grows bigger every year, and many necessary replacements must be made in 1957.

"The market for automatic oil burning equipment continues to grow at a rapid pace. To satisfy the needs for oil burners, the industry has the problem of training more engineers, sales engineers, technicians, and installation and service personnel," he said.

Stokers Inch Up in 1957

"MY GUESS for 1957 — based on factors known at present — is that it will be at least as good as 1956, and perhaps a little better," says L. C. Dubs, president of the Stoker Manufacturers Association.

"Regarding the stoker industry, there has been some pick-up in stoker sales. We don't, however, look for a rapid pick-up immediately. But for the long term we feel that a considerable improvement will be effected.

"The development of auxiliary devices which are used in connection with stokers such as screw conveyors for the automatic feeding of coal directly from the bin, the widespread adoption of combustion control systems, as well as smoke control systems, and other aids in firing coal has given the use of stokers a considerable boost and eliminated many of the unfavorable aspects in stoker firing which were formerly depressing sales," Mr. Dubs says.

"It appears that any improvement in sales will start in the larger sizes, and gradually filter down into the smaller commercial and residential, and, finally, domestic units," he says.

Steel Boiler Sales Up

AN OPTIMISTIC PICTURE of the prospects for the sale of steel boilers in 1957 is presented by R. A. Locke, president and general manager of the Steel Boiler Institute. He points out that sales of steel boilers for the first three quarters of 1956— final quarter figures not in at the time — were ahead of sales during the corresponding period in 1955.

The sale of larger size steel boilers is far ahead of last year, he reports. An increasing number of boilers are being sold for modernization work.

"The prospects for 1957 are very encouraging," he says. In 1956, volume — both in the number of boilers and total square feet of heating surface — compared favorably with that of 1955. The volume of high pressure units exceeded that of 1955. A slightly smaller number of heating boilers was shipped in 1956, but the boilers averaged larger in size, so a greater volume of heating surface was actually shipped.

Commenting on the "substantial backlog of orders and a very substantial volume of inquiries covering new construction," Mr. Locke sees in the coming months a "major problem of making deliveries on those boilers which require wide plates, since steel mill deliveries on these plates have been substantially extended, with no apparent immediate relief in this situation."

Boiler Safety Improves

PRESENTING the views of the Uniform Boiler & Pressure Vessel Laws Society, W. H. Heinrich, chairman, forecasts an acceleration in the trend toward complete air conditioning, "that is, toward control of moisture content together with temperature, filtration, and air change."

Such control — once regarded as a luxury — seems now to be accepted as desirable if not necessary for efficiency as well as for personal comfort, says Mr. Heinrich. "This trend is evidenced in transportation, homes, offices, and industrial plants. In our opinion, this trend will be emphasized in 1957."

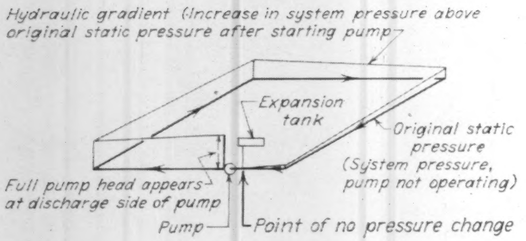
EXISTING OFFICE BUILDINGS will step up the growing air conditioning trend to compete with new buildings

The objective of the Uniform Boiler & Pressure Vessel Laws Society is the promotion of laws, rules, and regulations, uniform in nature, based on American Society of Mechanical Engineers Codes and affecting chiefly both safety and economy in the construction and inspection of boilers and pressure vessels.

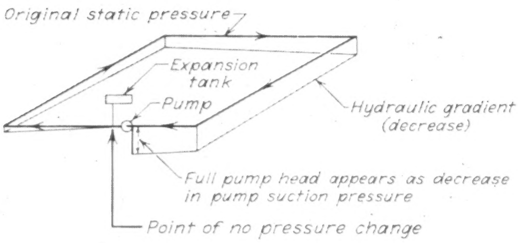
"The adoption of ASME based laws by the states has had a most salutary effect on the reduction of explosions, failures in service, and personal injuries involving high pressure boilers," reports Mr. Heinrich. "Similarly, improvement is shown with regard to low pressure vessels, although not to the same extent, largely because progress in the adoption of laws governing the construction and inspection of such vessels has lagged. At the present time, 13 states have no specific boiler or pressure vessel laws. Sixteen states which have high pressure boiler laws, either have no jurisdiction over low pressure heating boilers and unfired pressure vessels or merely ac-

(*Continued on page 338*)

For efficient operation of


Hydraulic gradient (Increase in system pressure above original static pressure after starting pump
Expansion tank
Original static pressure (System pressure, pump not operating)
Full pump head appears at discharge side of pump
Pump
Point of no pressure change

1 CONNECTION NEAR PUMP SUCTION causes system pressure at pump discharge to be higher than original system pressure by an amount equal to the pump head


Original static pressure
Expansion tank
Pump
Hydraulic gradient (decrease)
Full pump head appears as decrease in pump suction pressure
Point of no pressure change

2 CONNECTION AT PUMP DISCHARGE results in full pump head appearing as a decrease in pump suction pressure

Where Should Expansion Tank

Since changes in system pressure vary according to pump operation and according to the location of the expansion tank connection to the system, the expansion tank junction must be the point of no pressure change, whether the pump operates or not. Here's a brief but complete explanation of the principles governing the operation of the pumps in a hot water heating system.

BY HARRY TERRY, Consulting Engineer

Recently during a meeting of the Tarrytown, N. Y., school board, held to accept the architectural and mechanical and electrical plans for two new schools, there was a spirited discussion regarding the zone pump characteristics for a forced circulation hot water system.

To Answer Common Misconception

The argument was started by a voluntary engineer-advisor to the school board. His contention was that all zone pumps must operate against the head required for the zone having the greatest friction head.

Since this misconception is a common one, an analysis and discussion of the operation of zone hot water circulating pumps may be of interest and help.

The pressure in a hot water heating system, when no pumps are operating, is static pressure only. Starting a pump will cause a pressure difference, defined as pump head, to appear across the pump.

Where the expansion tank is connected near the pump suction, as shown in Fig. 1, the system pressure at the pump discharge is higher than the original system static pressure by an amount equal to the pump head. With the pump operating, pipe friction progressively decreases the pressure from that at the pump discharge to the original static pressure of the system at the pump suction where the expansion tank is connected.

It is important to note that system pressure changes vary according to the location of the expansion tank and its connection to the system.

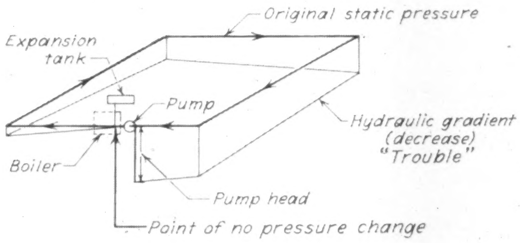
For example, if the expansion tank is connected at the pump discharge, as in Fig. 2, the full pump head appears as a decrease in pump suction pressure.

Specify Point of No Pressure Change

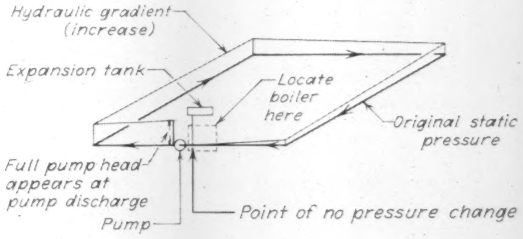
Thus, by specifying the point of no pressure change, whether pump operates or not, we can govern the system pressure changes caused by pump operation.

The author is a member of the New York Association of Consulting Engineers.

forced circulation hot water heating systems . . .


Original static pressure
Expansion tank
Pump
Hydraulic gradient (decrease) "Trouble"
Boiler
Pump head
Point of no pressure change

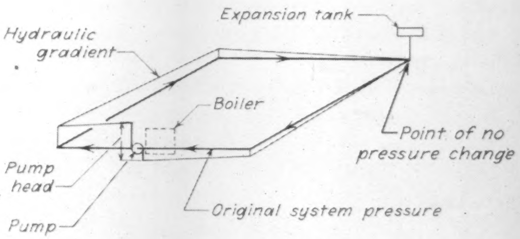
3 EXPANSION TANK AT PUMP DISCHARGE for high pump head systems decreases pump suction pressure by an amount equal to full pump head


Hydraulic gradient (increase)
Expansion tank
Locate boiler here
Original static pressure
Full pump head appears at pump discharge
Pump
Point of no pressure change

4 FOR ALL SYSTEMS, expansion tank connection at suction side of pump assures that pump head will give positive increase in pressure at pump discharge

Be Connected?

. . . near the pump suction?
. . . at the pump discharge?
. . . at a distance from the pump?


Expansion tank
Hydraulic gradient
Boiler
Point of no pressure change
Pump head
Original system pressure
Pump

5 CONNECTION AT DISTANCE FROM PUMP adjusts system pressure changes resulting from pump operation

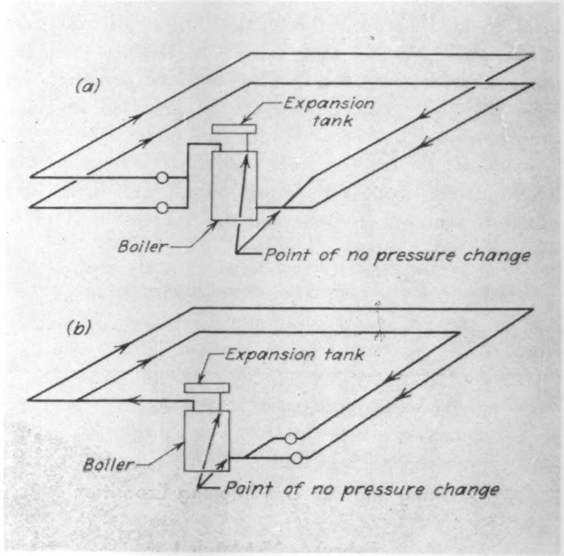
The "point of no pressure change" is at the connection of the expansion tank to the system, since a change of pressure in the expansion tank can only be caused by a change in air volume in the tank; and this can be caused only by a change in the volume of water in the system. The operation of the circulating pump does not change the volume of water circulated, which changes only by change in water temperature. So the volume of water and air in the expansion tank remains constant and the pressure likewise.

Therefore, the junction of the expansion tank with the system must be the point of no pressure change, whether the pump operates or not.

For high pump head systems—defined as systems where pump head is greater than the initial static pressure at the highest point in the system—if the expansion tank is placed at the pump discharge, the pump suction pressure will show a drop in pressure equal to the full pump head, as illustrated in Fig. 3.

The decrease in system pressure may cause the following troubles:

1) Air bound unventable circuits caused by below


(a)
Expansion tank
Boiler
Point of no pressure change
(b)
Expansion tank
Boiler
Point of no pressure change

6 IN TWO CIRCUIT SYSTEMS each pump must overcome friction head of its own circuit. In high head pump system (a), each pump develops positive head; in low head pump system (b), each pump develops negative head atmospheric system pressures.

2) Suction of air into the system through air vents, pipe joints, etc. caused by below atmospheric system pressures.

3) Unstable, unbalanced circuit water flows caused by system boiling due to the reduction in pressure.

4) Noisy cavitating pumps.

5) Mechanical pump failure.

6) Unreliable pump head readings caused by cavitation and boiling.

7) Discharge of boiler relief valves due to pump operation, caused primarily by system boiling or by large air pockets in the system other than at the tank.

Place Tank, Boiler at Pump Suction

On low pump head systems, the pump energy is not enough to radically affect system pressures. On such systems it is not necessary to pump away from the boiler and expansion tank but it is good practice.

For all systems, placing the expansion tank connection at the suction side of the pump, as in Fig. 4, assures that the pump head will give a positive increase in pressure at the pump discharge.

As explained above, the system head will then progressively decrease to the original static pressure at the pump suction. Because the pump suction pressure is unchanged by pump operation, the boiler should be placed at the pump suction.

Location of the expansion tank connection at a distance from the pump adjusts the system pressure changes resulting from pump operation as indicated in Fig. 5.

Each Pump Must Overcome Zone Friction Head

Pressure gage readings at the pump show the pump head divided between the suction and discharge sides of the pump. Where tanks are at a distance from the pump it is recommended that the water be pumped away from the boiler and connections be provided for minimum pressure loss between tank and boiler inlet.

It should be evident from the above discussion that where several zone circulating pumps are used, each pump is required to overcome the friction head of its own particular circuit, as shown in Fig. 6. ╪

Illustrations and some of the source material courtesy Bell & Gossett Co.

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Heating and Air Conditioning Exposition

February 25-March 1

International Amphitheater, Chicago

How to Design Coolant Piping

. . . and estimate requirements for a central industrial coolant system

BY JAMES C. BISHOP
Plant Engineer

Also given in this article are suggestions on the design and installation of piping and flow nozzles for velocity cleaning-cooling of grinders and turning machines in new installations and for conversion of existing separate machine tools to a central coolant system.

ONE of the first problems that confronts the designer of a central coolant system for an industrial machine plant is "how much coolant will each machine use?" That is a very good question because the whole system depends on a reasonable estimate of total coolant requirements.

First, it should be understood that the amount of coolant required by the various machine tools should not be determined from the size of the coolant pump usually furnished with a machine tool. Here is the reason. Nearly all machine tools in the past have been equipped with their own individual coolant systems, complete with a coolant pump. It will be found that this pump has a rating of several times the volume and pressure actually used.

If the engineer insists upon an actual measurement of coolant volume by the manufacturer, the manufacturer may provide an answer if he happens to have the particular machine tool in stock. Here again, the manufacturer will probably be guided by the rating of the pump he has always used.

Measure Coolant Issuing from Nozzle

The best way is to actually measure the coolant issuing from the machine's coolant nozzle. This

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The author is in charge of heating, ventilating, process piping, large scale air handling, hydraulic conveying, and other similar work in a large industrial plant. The name of the plant is withheld at company request.

Two previous articles by the author on industrial coolant systems were published in the September and October 1952 HPAC's.

can be done by measuring the coolant requirements for the type of machining being contemplated. If the designer cannot measure a similar operation in his own plant, there is usually a neighboring plant doing something similar. A stopwatch and container can be used to measure small flows. Large flows, however, cannot be measured as conveniently.

In that case, an altitude gage can be used. It should be such a gage that low heads can be easily indicated, so don't expect to read 1 ft on a 250 ft gage.

Attach a $\frac{1}{4}$ in. copper "pigtail" to the gage. Make a long sweep 90 deg bend in the copper tubing so you can keep the gage in the same horizontal plane as the nozzle. Then at the end of the tubing, make another 90 deg bend. This bend should point vertically up. Insert this end in the nozzle to be measured. If the tube is just barely inserted into the nozzle, the resulting head will, for all practical purposes, be the velocity head.

The velocity of the coolant will be:

$$V = \sqrt{2gh} \quad \ldots\ldots [1]$$

And the volume of coolant will be:

$$Q = AV \quad \ldots\ldots [2]$$

where: A = area of nozzle opening, sq ft; V = velocity, fps; Q = volume, cfs, g = 32.2 ft per sec per sec; h = head, ft.

Let's consider a nozzle on a horizontal grinder. This nozzle is $2\frac{1}{2}$ in. wide by $\frac{5}{8}$ in. deep, and the head at the mouth of the nozzle is 2 ft. The velocity then is:

$$V = \sqrt{2 \times 32.2 \times 2}$$
$$= 11.3 \text{ fps} \quad \ldots\ldots [3]$$

Volume is:

$$Q = [(2.5 \times 0.625)/144]\ 11.33$$
$$= 0.122 \text{ cfs} \quad \ldots\ldots [4]$$

Then, the number of gallons per minute, where the cubic feet per gallon = 0.134, is:

$$(0.122/0.134)60 = 54 \text{ gpm} \quad \ldots\ldots [5]$$

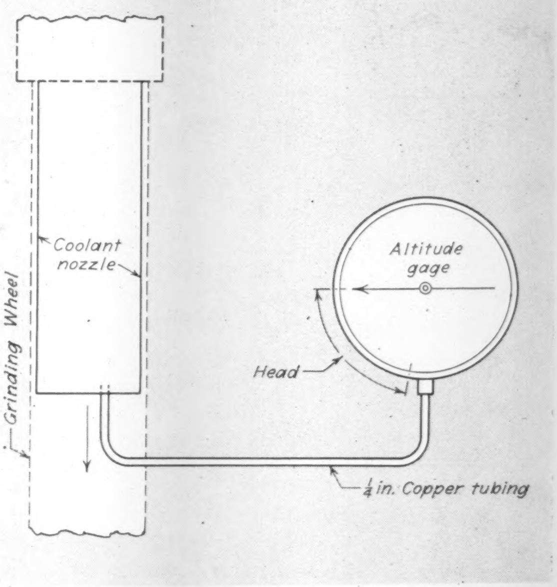
There are three nozzles on this grinder, so it is using 162 gpm.

Grinders having wheels that are less than 2 in. wide usually use about 5 gpm per in. of wheel width. This applies to the vertical grinder, which grinds on its peripheral surface. In the case of both turning and grinding machines, an extra allowance must be made for velocity jets for keeping the machine clean. Usually 5 to 10 gpm does the job if a reasonably high velocity is used.

Nozzles for velocity cleaning can be purchased at a nominal cost from any manufacturer of commercial nozzles. Nozzles for this purpose can also be made from $\frac{1}{2}$ in. pipe nipples by hammering the open end into a nozzle shape. However, the commercial nozzles, because of their good design, will do a better job with less coolant required.

Wash Effect Keeps Machines Clean

One of the prime objectives of a central coolant system is to keep a machine tool clean enough so the plant janitors will not have to stop production to clean out the machine. That means that chips or grindings should be washed away from the tools as fast as they are turned out. In the case of grinders, the mud can be washed away with low velocities. For a cutting tool, it usually requires an impact together with a higher velocity to do the job.



MEASURING LARGE COOLANT FLOW requires altitude gage which easily indicates low heads. Attached to the gage is a $\frac{1}{4}$ in. copper tube, the other end of which is inserted in the nozzle to be measured

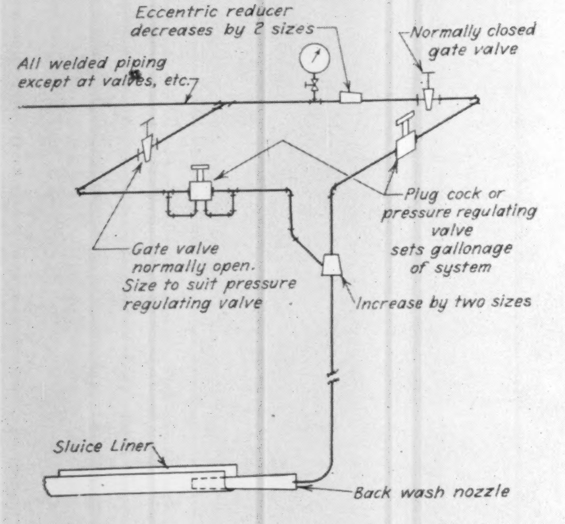
The washing effect for a grinder is best obtained by filling the machine sump with concrete. The concrete should have a smooth hard surface. A velocity channel should be trowelled directly under the grinding surface. The nozzle should then be located so it lays on the invert of the channel, because the grindings sometimes tend to fuse together. After the jet effect of the nozzle has dissipated itself, the channel flow should be fast enough to wash the grindings mud out of the machine before it has a chance to settle.

The wash nozzle should be on a separate line from the machine coolant nozzle. This is so the wash will continue even after production has ceased, to be sure that no mud is left in the drain to settle and harden in the machine drain line.

The channel velocity depends on how much coolant it handles, its size and slope. It is not necessary to determine the size of each channel. Just get an even slope to the drain outlet of the machine. A velocity of 3 fps usually will wash mud out of a grinder, and 7 fps will wash away the chips. Knowing how much coolant is to be used for machining, select some gallonage for velocity wash. Together, these two quantities represent the total wash. The total wash will also be the gallonage required by the machine.

How to Calculate Machine Wash

The designer should determine how much machine wash he is furnishing. That can easily be done in the


Eccentric reducer decreases by 2 sizes
Normally closed gate valve
All welded piping except at valves, etc.
Plug cock or pressure regulating valve sets gallonage of system
Gate valve normally open. Size to suit pressure regulating valve
Increase by two sizes
Sluice Liner
Back wash nozzle

PRESSURE REGULATING VALVE permits one or all machines to operate at the same coolant pressure

maintenance shop with a 10 gal drum, a length of vitrified clay pipe and a stopwatch.

Connect a hose to the water supply tap to measure the rate of flow. After establishing a flow that looks reasonable for the particular washing job in mind, determine the minimum channel slope. Guide into the channel tile the established flow. Drop a wad of chips into the stream and time its flow. Keep reducing the slope of the tile until the velocity of the chips is reduced to some desired minimum speed.

That will show what the minimum slope can be. This information may come in handy if the machine has a high drain opening. Where the drain opening is low, there is no problem as long as the slope is steady.

If existing machines are being converted to a central coolant system, the machines' coolant pumps should be removed. The pump suction then will be the machine drain.

For grinders, washing consists mainly of filling the sump with concrete and providing a 3 fps wash. A turning machine is more complex.

Often in the case of a new machine a chute can be specified in its bottom, so chips can fall directly into the main sluice. Some machine tools rotate at intervals. There are so many turning operations on this type of machine that often a scraper blade and trough can be connected to the machine to hoe the chips into a common drain chute. This will save a lot of coolant.

One of the most discouraging problems when attempting to wash chips out of automatic machine tools is interference due to the many hydraulic oil lines. The machine is usually operated and indexed by a high pressure hydraulic oil system. In the past, the chips were cleaned from these machines by hand. The builder of these machine tools then did not have reason to be too particular about where he located his hydraulic lines. What he was mainly concerned with was developing a machine tool to do a definite machining job.

When new machines are being purchased for use on a central system, the machine sales representative should be informed as to how the chips are to be removed. It is important that hydraulic piping be kept clear of the machine drain area.

In the case of converting existing machine tools to a central system, it is sometimes worthwhile to relocate the hydraulic piping. Otherwise, it may be necessary to use multiple impact jets for knocking chips out of the machine.

Correct Pipe Friction Loss as for Clean New Pipe

Having discussed briefly problems that will be encountered at the machine and methods for determining the amount of coolant these machines will require, let's consider briefly the piping.

It is assumed that the designer will provide a good filtering system to clean all the re-used coolant. That is important because from the piping consideration alone, clean coolant is very desirable. If the coolant is clean, the pumping head will be fairly uniform over the years. Also, pressure gages and pressure regulators won't foul up so often.

Assuming the coolant is well filtered, a velocity of about 11 fps is good for the following reason. If there is a fairly rapid velocity, the unfiltered particles in suspension will not tend to deposit on pipe walls. Soluble oil and water coolant will not cause rust.

If the coolant is clean, the inside of the pipe should stay clean. Therefore, the designer is justified in correcting the friction loss on the basis of "clean new pipe." If Cameron's "Hydraulic Data" is used, the friction loss per 100 ft can be multiplied by 0.54. So, if under normal piping the result is 100 ft friction head, that can be corrected to 54 ft. To this should be added the elevation head, if any.

At the end of the system, a plug cock should be provided so as to adjust the sluice backwash.

A combination pressure altitude gage should be mounted very close to the pump. A pump having a fairly flat performance curve should be selected to take care of production fluctuations.

Install Bypass Line Around Plug Cock Valve

It is a good idea to install a bypass line around the plug cock. A carefully sized pressure regulating valve is then installed in the bypass. The pressure regulating valve does not have to be elaborate. A spring loaded valve with upstream and downstream "feeder" lines does an excellent job of holding a steady pressure on the system. Should the regulating valve need servicing, the bypass can be closed, and the plug cock will regulate the pressure.

If on certain days an unusually large amount of

"... coolant velocity of 11 fps prevents settling"

coolant makeup is required for the same machining job, this is not always a sign that something is wrong.

Suppose that 100,000 cfm of outside air at 20 F and 90 percent relative humidity is tempered to 75 F and is introduced into the machine area for ventilation. That much air, when heated from its outside condition 75 F, would absorb a lot of water.

There are, we will say, 75 machines in the area, and each machine has one or more coolant nozzles. These nozzles tend to saturate the surrounding atmosphere. Added to that, each part that is machined is covered with coolant droplets. Therefore, it is not hard to visualize a saturating efficiency of at least 50 percent.

Outside air at 20 F and 90 percent relative humidity contains 0.0019 lb of water vapor per lb of dry air. When this same air is heated to 75 F and 50 percent relative humidity, it would hold 0.0093 lb of water per lb of dry air. Then the total water absorbed is:

$$(0.0094 - 0.0019)100{,}000\ (4.5) = 3375 \text{ lb per hr.} \quad \ldots[6]$$

or about 400 gph. That much water would be liberated by either a central coolant system or a selfcontained system. There is, however, slightly more evaporation from a central coolant system due to surface evaporation at the settling tank.

Install Pressure-Altitude Gage Close to Pump

Installation of pumps will not be discussed here. Often the sales representative of filtering equipment will want to know what gallonage is being pumped even though a filter for a specific flow has already been purchased. An engineer thinks of pump performance in terms of discharge head in feet. The maintenance man thinks of pounds pressure. If a combination pressure-altitude gage is installed on the pump discharge, no mental arithmetic is involved.

By adjusting the plug cock and pressure regulating valve at the end of the system, one can consult the pump performance curve and predict the gallonage quite closely. It's a good idea to connect the gage close to the pump, ahead of gate or check valves. Then a pretty accurate pressure gage reading may be obtained.

The best way, in my opinion, to convey chips or mud from machines is hydraulically. Vitrified clay tile makes an inexpensive sluice for cast or aluminum machining. The tile should be carefully selected so it is free of blisters. The invert of each joint should be level.

Steel lined sluices are best for steel turnings. The steel should be well anchored to the grout with grab bars to withstand the force of expansion.

Steel and concrete expand at near the same rate. During hot weather, a coolant temperature of 95 F is not unusual. The floor temperature may be only 70 to 75 F. If the steel is not in intimate contact with the grout, the steel will creep in hot weather and buckle.

Probably not enough drainage will be picked up from the machines to create the desired sluice velocity. That is the reason for a controlled sluice backwash. It is better to use a backwash at the start of the sluice than to provide velocity nozzles in the sluice as some designers are tempted to do. These nozzles do not impart sluice velocity except by the weight of the liquid they furnish. Actually they are harmful because they create turbulence.

Realizing that the backwash will not run the sluice full enough to create the desired velocity at the start of the sluice, it is well to use a long tapered nozzle to get an initial velocity of 12 fps. A hydraulic jump may occur, but try not to have the wave directly under a heavy turning operation.

Choose Filter Low on Maintenance

Before making a decision to buy any filter, it is often helpful to visit some plant that is doing the same kind of machining job. Talking with maintenance personnel may uncover faults that had been previously overlooked.

Find out how often grinding wheels have to be dressed. The job setter usually will comment on this without much coaxing.

It is not necessary, for instance, in the case of a filter for turnings, to filter out everything. Most of the ferrous particles will settle out before they reach the filter. The few particles that are under 0.004 in. may pass through the filter but they will not hurt the finish.

A good filtering system for grinders is very important, otherwise grinding wheels will "load," causing frequent dressing. Also, scum will build out from the inside of pipe walls, finally plugging the pipe.

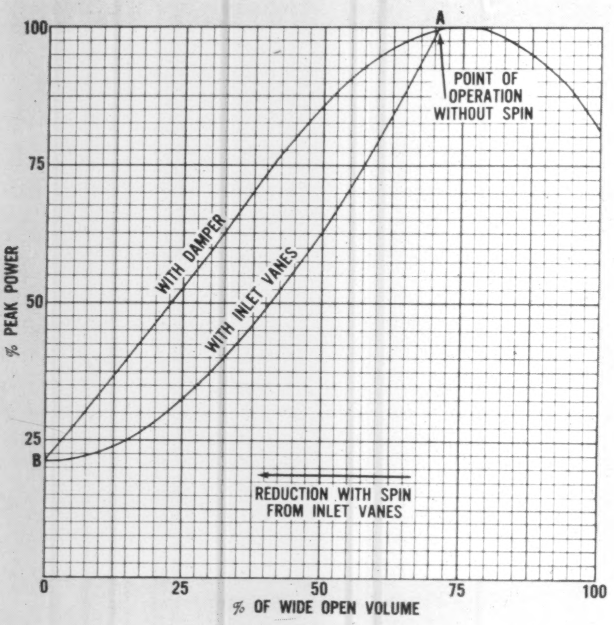
Each of the two filtering jobs mentioned above requires a different kind of filter, especially for low maintenance. Because grindings mud is greasy, a filter of the throwaway type is indicated.

Turnings, however, are comparatively easy to filter, so a good selfcleaning filter is worth consideration. As a safety precaution, the backwash or automatic cleaning pressure should be increased.

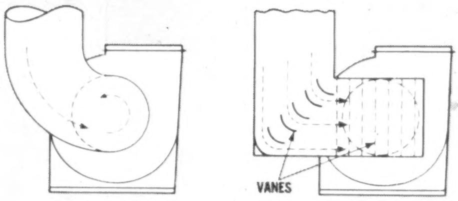
The use of additives to the coolant is not recommended. These additives have been developed to keep wheels on selfcontained grinders from loading. When added to a good filtering system, they loosen any scum in the system, so the filter cannot keep up with the new filtering duties. This is not only expensive but pressure regulators and pressure gages foul up.

Do not be alarmed if after a shutdown the coolant smells rancid. The odor will disappear after about 1 hr of operation.

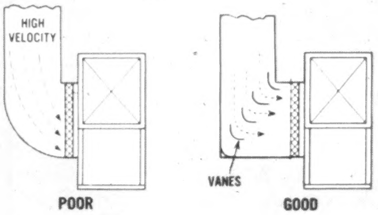
In a well designed central coolant system, the coolant will remain sweet for years without using any additives.#



1 EFFECT OF SPIN of fan volume and power is shown here. Fan output and the power used decrease with air spin in the direction of wheel rotation



2 COMPOUND CURVE on fan inlet duct, left, causes spin. Vanes in elbow and at fan inlet eliminate spin



3 UNIFORM INLET DISTRIBUTION, through proper use of vanes, improves fan operation, reduces noise

How to Install Centrifugal Fans

BY R. G. LUBINSKY

Manager, Fan Dept.
The Trane Co.

By following the good principles of fan design and installation described here, you can minimize capacity loss and noisy operation of centrifugal fans. Even detrimental effects of space limitations can be reduced by designing the best possible fan inlet and discharge arrangements and avoiding improper installations.

Capacity loss, noisy operation, and vibration can be avoided by:

1) Providing for uniform distribution of velocity, eliminating spin, and allowing for adequate space at the fan inlet.

2) Providing proper length of discharge duct, good discharge direction, and proper use of vanes and dampers at the discharge.

Most Complaints of low capacity and noisy operation of centrifugal fans for heating, ventilating, and air conditioning systems can be traced to improper installation. If the fan room design and installation follows well established principles, such improper installations are not likely to occur.

There are times when all of the rules cannot be followed because of space limitations. However, if one is completely familiar with the principles of good fan installation, he can usually design and install the fan equipment to minimize any deterimental effect.

Watch Inlet and Discharge Design

Often, when the system capacity is low or when noisy and pulsating operation is experienced, the first tendency is to blame the fan. If capacity measurements were correctly made and if mechanical imperfections such as a clockwise wheel in a counter-clockwise housing, incorrect wheel position, or wrong rotation do not exist,

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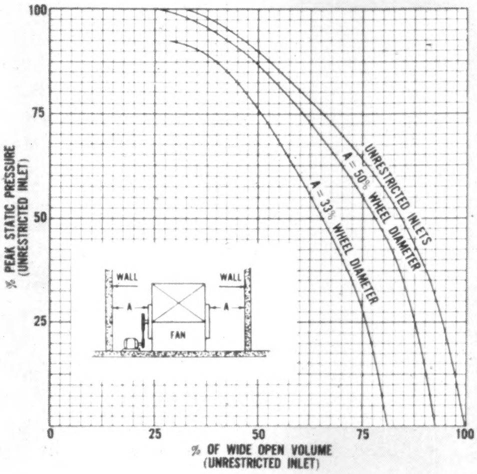
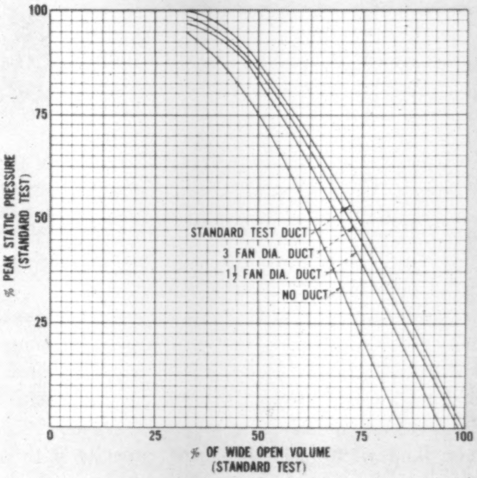
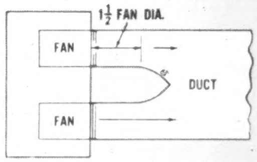
The author is a director of the National Association of Fan Manufacturers.



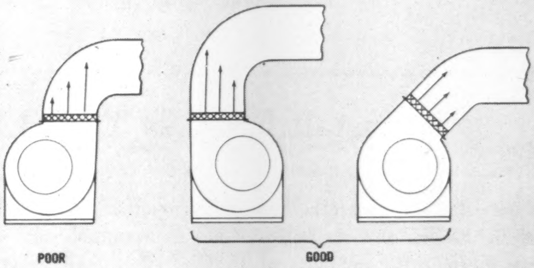
4 SPACE RESTRICTION reduces static pressure, show tests on double inlet fan



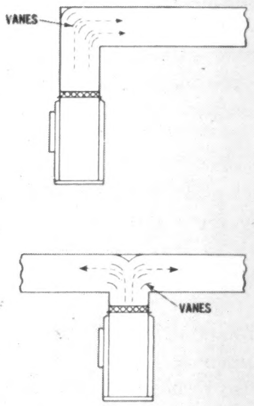
5 DUCT EXTENSION from fan should be straight, same size for 1½ fan diameters


1½ FAN DIA.
FAN
FAN
DUCT

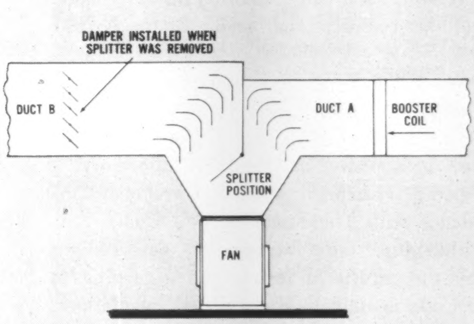
6 "PAIR OF PANTS" DUCT is correct outlet for multiple fans



7 DISCHARGE DIRECTION with proper vanes can minimize non-uniform velocity


VANES
VANES

8 ELBOW VANES reduce losses, noise, and vibration


DAMPER INSTALLED WHEN SPLITTER WAS REMOVED
DUCT B
DUCT A
BOOSTER COIL
SPLITTER POSITION
FAN

9 SPLITTER DAMPER caused air to bounce back from booster coil in duct *A* into duct *B* the trouble can almost invariably be traced to improper fan inlet and discharge conditions.

When laying out a fan room, the time spent in designing to get the best possible arrangement at the fan inlet and discharge will pay big dividends in quiet, trouble free, and efficient operation.

Three Fan Inlet Conditions Reduce Capacity

At the inlet to the fan, spinning air stream, non-uniform air distribution, and insufficient space between fans or from fan inlet to wall can reduce capacity.

- *Spin.* If the spin is in the direction of wheel rotation, the capacity will be reduced and the power consumption will drop. If the spin is counter to wheel rotation, power consumption will increase and the fan will operate with noticeably more noise.

To understand what happens to the capacity with a spin in the direction of wheel rotation, one has only to consider what effect an adjustable inlet vane has on fan capacity. The curves in Fig. 1 show how the capacity and power drop as the spin becomes greater.

At point *A*, the inlet vanes are completely open, and therefore, there is no spin. As the vanes move toward the closed portion, they spin the air in the direction of wheel rotation. As a result, the output volume of the fan decreases, and the power used follows the lower curve to point *B*, at which point the vanes are completely closed.

Spins can be caused by coil location or duct design. Both coils and inlet ducts should be located so that their center lines coincide with the fan center line.

Spin can also be caused by inlet duct design. A compound curve on the fan inlet duct, as shown in Fig. 2, will cause the air to spin as it enters the fan wheel. By using vanes, both in the elbow from the vertical to the horizontal and at the fan inlet, spin can be eliminated.

- *Non-uniform Distribution.* Improper distribution of air into a fan inlet will cause trouble. The fan cannot possibly operate as effectively and as quietly if most of the air is being forced into only a portion of the inlet opening. This can be eliminated through the proper use of vanes. See Fig. 3.

- *Space.* When there are no inlet ducts, fan capacity is affected when the space between fans on a multiple fan installation or between the fan inlet and the wall is too small. The curves in Fig. 4 show the effect of such space restriction on fan performance. These curves were made from tests on a forward curve, double width, double inlet centrifugal fan.

General practice is to locate multiple fans at least one fan diameter apart, and not to place a wall closer than

Install Fans As Tested to Develop Ratings

FAN manufacturers have been working together for years in the National Association of Fan Manufacturers to establish methods of testing, laboratory standards, and test personnel requirements so that accurate ratings can be presented to those who specify and purchase fans. Many fans now carry a certified rating seal indicating that they have been tested and rated in accordance with the code adopted jointly by NAFM and the American Society of Heating and Air-Conditioning Engineers.

Some of the qualifications for use of the NAFM seal are:

"1) Possessing the technical knowledge, skill and facilities to test fans in accordance with The Standard Test Code; or in lieu thereof, using the services of an approved independent laboratory.

"2) Testing centrifugal, axial and propeller fans in accordance with The Standard Test Code.

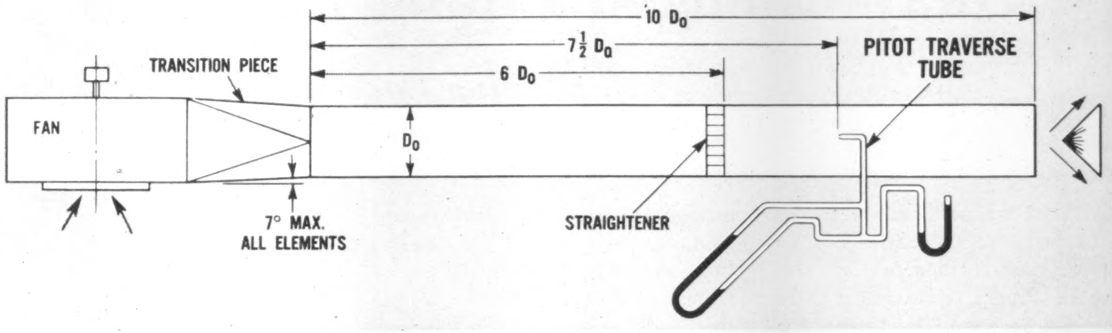
"3) Publishing fan ratings or performance which are the results of tests made according to Standard Code methods and permitted calculations.

"4) Maintaining such manufacturing control that fans when sold under the NAFM seal shall perform so that when operated to deliver the rated volume and pressure, at the rated density, the speed shall be within 2½ percent of the rated speed, and the shaft horsepower shall not exceed the rated shaft horsepower by more than 5 percent. Rated values of the volume, pressure and shaft horsepower are understood to be such values published in catalogs, bulletins, performance curve or other communications. Published performance shall be based on test results or permitted calculations."

The test code outlines a precise procedure and carefully controls the fan inlet and discharge conditions. One common method of testing is shown in Fig. 10.

Make Allowances for Appurtenances. To develop precisely catalog ratings, fans must be installed exactly as they are tested. The addition of appurtenances, such as dampers and inlet vanes and the use of bearings and bearing supports where these are not on the fan when tested, or the use of bearings substantially larger than standard, will reduce performance.

On a precise installation, it is well to take these things into account when establishing the speed and horsepower of the fan. Estimates of the effect of the various modifications can be obtained from the manufacturer.



10 COMMON FAN TEST ARRANGEMENT meets conditions outlined in test code. Inlet is unobstructed so that air enters in straight stream. Discharge duct is straight with uniform cross section area equal to fan outlet

one-half fan diameter from the inlet. Even these minimums result in a decreased capacity. Greater distances should be used if at all possible.

Rarely is it possible to provide ideal discharge conditions such as used during a fan test, with the discharge duct unchanged in size or direction for a distance equal to a number of fan diameters away from the fan discharge. However, the discharge duct should be extended unchanged in size or direction as far as possible. The air velocity as it leaves the fan discharge is not uniform. This variation in velocity is somewhat greater on forward curved fans than it is on non-overloading fans. For full fan capacity, the duct must be extended until the velocity is fairly uniform over the entire duct cross section. In a distance equal to 7½ fan wheel diameters from the discharge, the air velocity will be fairly uniform.

This accomplishes two things: it results in good conversion from velocity to static pressure and permits the use of standard pressure loss data in estimating duct friction. With non-uniform velocities, the data would not provide the correct figures.

The 7½ fan diameter duct can seldom be used, but that is not too serious. The curves in Fig. 5 show the results of tests on a forward curved fan. Notice that there is a substantial reduction in capacity if no duct is used. A duct of 1½ fan diameters reduces the volume from the code test by only a slight amount, while a duct of three diameters provides almost the same result as the code test.

As a general rule, then, an effort should always be made to carry a straight duct the same size of the fan discharge for at least 1½ fan diameters from the discharge. With multiple fan installations, use a "pair of pants" as shown in Fig. 6.

- *Use Proper Vanes in Discharge Elbows.* When, because of job conditions, elbows must be installed near the fan discharge, the bad effects can often be minimized by the use of vanes and by proper selection of the fan discharge location and direction of rotation. When necessary to place an elbow near the fan discharge where the velocity is not uniform, arrange to have the high velocity side at the outside radius of the elbow rather than on the inside. See Fig. 7. Elbows with a high velocity on the inside may have a pressure loss of four to five times that with uniform distribution, while a high velocity on the outside may even make the pressure drop less than it would be with uniform distribution.

Elbows that turn discharge ducts parallel to the fan shaft of single width fans will generally have a lower loss if the turn is toward the inlet rather than away from it. On single width fans, both forward curved and non-overloading, the highest velocity is at the side opposite the inlet.

The use of proper vanes in elbows at the fan discharge will generally reduce losses and result in smoother, quieter operation. See Fig. 8.

As an example of how conditions at the discharge can affect the entire operation of the system, consider an installation as shown in Fig. 9. This was a large non-overloading type fan installed in a textile mill. It was reported that the system was pulsating so badly that some of the ducts were being torn apart. When I first visited the job, I found gravity release dampers rattling so badly that people living in the vicinity of the plant could not sleep.

The sides of the air washer plenum were oil canning badly. Everything that could move that was in any way in contact with this system was vibrating excessively.

The splitter damper shown in Fig. 9 had been installed in the position shown to get the proper balance even though only about one-third of the air was needed down duct *A*. Because of a booster coil in duct *A*, its pressure loss at the proper volume was somewhat greater than that in duct *B*.

With the splitter set as shown in the sketch, the fan had a tendency to discharge the air into duct *A*, but because it could not flow down that duct it had to bounce back and go down the small space between the splitter and the side of the trunk duct into duct *B*.

When this splitter was removed and louver dampers were installed as shown in duct *B* to get the proper balance, the pulsating effect was eliminated and the entire system operated smoothly and quietly. ǂ

Okay Changed Piping Practices

. . . pending Code revision

From time to time certain actions of the Sectional Committee B31 on the American Standards Code for Pressure Piping, sponsored by the American Society of Mechanical Engineers, are published for the information of interested parties. While these actions do not constitute formal revision of the Code, they may be utilized in specifications, or otherwise, as representing the considered opinion of the Committee.

Pending revision of the Code for Pressure Piping, ASA B31.1-1955, the Sectional Committee has recommended that the ASME, as sponsor, publish selected interpretations.

The following cases are published herewith as interim actions of Sectional Committee B31 on the Code for Pressure Piping and will not constitute a part of the Code until formal action has been taken by the ASME and by the American Standards Association on a revision.

Case No. 22

Inquiry: In the ASA B31.1-1955 Code for Pressure Piping, Section 3, Par. 325 (Table II) the Type H solder joint fittings for Instrument and Control piping and their ratings are limited to those conforming to ASA Standard B16.18. Are wrought solder joint fittings conforming to ASA Standard B16.22 acceptable? Is it permissible to apply the fittings to service other than those indicated in Table II? May the rating vary with the types of solders used?

Reply: It is the opinion of the Committee that wrought solder joint fittings conforming to ASA Standard B16.22 may be included as Type H fitting in Par. 325 (Table II) in the subject Code. The services of Type H solder joint fittings shall be limited to those specified in Par. 325 (Table II), and the ratings shall be limited to those published in the ASA Standard B16.18 for cast fittings and ASA Standard B16.22 for wrought fittings, for the solders specifically named in each standard.

Case No. 23

Inquiry: Do the provisions of Par. 831.41 (b), Section 8 of American Standard Code for Pressure Piping (ASA B31.1.8-1955) apply to reinforcement sleeves, placed over welds or dresser type couplings?

Reply: Par. 831.41 (b) applies to local reinforcement of welded branch connections, but not to reinforcement sleeves of circumferential pipe line joints. It should be the responsibility of the installer to determine that failure of neither the reinforcing sleeve nor the carrier pipe will occur, should fluid become trapped in the annular space between.

Case No. 24

Pending the publication of a new edition of Section 8, Gas Transmission and Distribution Piping Systems, of the Code for Pressure Piping, the following changes are hereby in effect:

Paragraph 824.23: Delete the words "and hardenability" in the third sentence.

"Alloy steels having weldability characteristics demonstrated to be similar to these carbon steels shall be welded, preheated, and stress relieved as prescribed herein for such carbon steels."

Paragraph 831.22: ASTM Specification A354 Quenched and Tempered Alloy Steel Bolts and Studs with Suitable Nuts is approved as an additional material where ASTM A193 is now listed.

ASTM Specification A325 Quenched and Tempered Steel Bolts and Studs with Suitable Nuts and Plain Hardened Washers is approved as an additional material where ASTM A261 is now listed.

Paragraph 841.16 (f): Change the word "moisture" to "water" in the second and the last sentences.

Paragraph 841.262: Delete the present wording and substitute the following new requirement:

"Electrical test leads may be attached directly on to the pipe by the thermit welding process using aluminum powder and copper oxide, provided the charge is limited to No. 15 (15 gram) cartridges and the size of electrical conductor restricted to No. 6 AWG or smaller. Where the application involves the attachment of a larger wire, use a multistrand conductor and rearrange the strands into groups no larger than No. 6 AWG and attach each group to the pipe separately, using a No. 15 (15 gram) cartridge of powder. Attaching electrical test leads directly onto the pipe by other methods of brazing is prohibited."

Paragraph 845.21: Change the word "are" to "include" in the first sentence.

"Suitable types of protective devices to prevent overpressuring of such facilities include:"

Paragraph 845.32: Change the word "are" to "include" in the second paragraph.

"Suitable types of protective devices to prevent overpressuring of a high pressure distribution system include:"

Paragraph 845.42: Change the word "are" to "include" in the second paragraph.

"Suitable types of protective devices to prevent overpressuring of low pressure distribution systems include:"

Paragraph 845.62: Delete the last sentence and substitute new wording.

Paragraph will read as follows:

"The discharge stacks, vents, or outlet parts of all pressure relief devices shall be located where gas can be discharged into the atmosphere without undue hazard. Consideration should be given to all exposures in the immediate vicinity. Where required to protect devices, the discharge stacks, or vents, shall be protected with rain caps to preclude the entry of water."

Paragraph 849.1 (a): Delete the present wording entirely and substitute the following:

"(a) Valuts and pits shall be designed and constructed in accordance with good structural engineering practice to meet the loads which may be imposed upon them."

Case No. 25

Inquiry: Paragraph 841.432 literally interpreted could imply a degree of perfection not attainable with even the most modern equipment. What constitutes compliance with this requirement?

Reply: It is the opinion of the committee that the practical limitations of modern equipment shall be given proper consideration. This section requires the exercise of responsible and experienced judgment rather than numerical precision. ǂ

Air Conditioning Goes to the Hogs

. . . reduces losses, saves feed, and cuts fattening time

AIR CONDITIONING is going "down on the farm" to cool off porkers and thus stave off the usual summer drop in production.

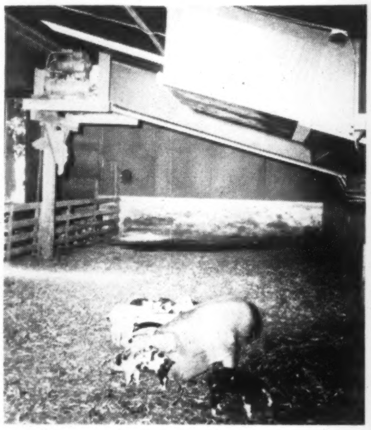
Hogs kept in comfort controlled climates in studies at Purdue university and the University of California were healthier, fatter, and required less feed to attain marketable weight.

The tests showed that temperatures directly affect hog production. They showed that the hogs prospered and grew in a controlled temperature of 65 F but languished and shriveled in 90 F heat.

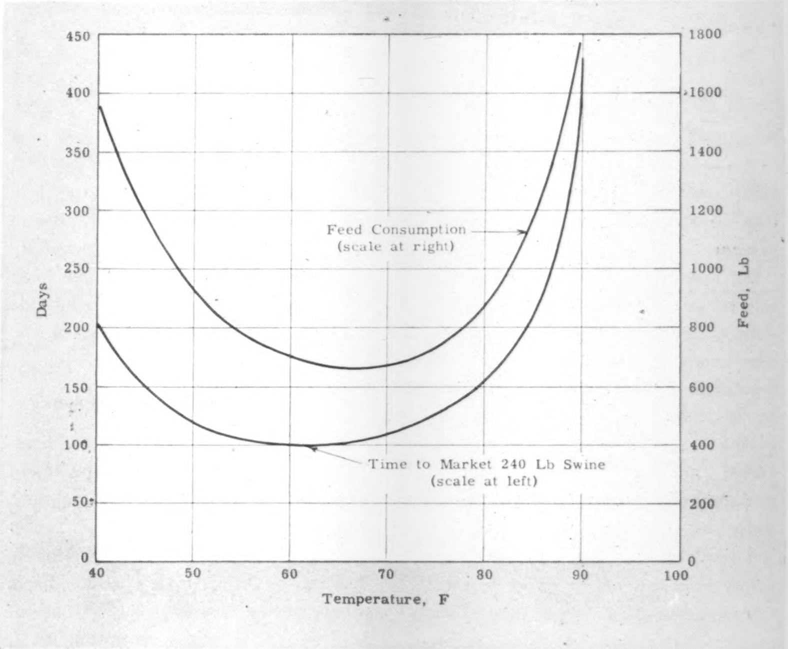
Hearing of these experiments, Charles Reish and his son Dick, owners of a hog farm near South Bend, Ind., decided last summer to do something to prevent losses. The hot humid weather for which Indiana summers are famous had been taking its toll of their hogs for some time. As the mercury soared, appetites dropped off, weights went down, and brood sows, sluggishly hovering over their young, crushed to death more piglings than usual. Feed bills also rocketed upwards as the time to ready a pig for market was greatly increased.

A 10 ton cooling installation was made, consisting of two condensing units, two fan coils, and a cooling tower. Walls of the hog house were insulated and the structure generally was tightened up. Soon its inmates were lolling comfortably in a pleasant 65 F temperature. ǂ

ON THE JOB



LIFESAVER for little pigs, many of whom were formerly smothered by their heat weary mothers, air conditioning of hog barn by two 5 ton units provides constant 65 F temperature for 185 porkers



TEST RESULTS show that at 65 F pigs required one-third as much feed as at 90 F to add each pound of weight. Marketing time was cut from almost a year to 100 days

Chemical treatment of boiler feedwater three times a week by adding a small amount of hydrazine hydrate to control pH and remove dissolved oxygen — the two major causes of corrosion in steam generating systems — paid off in this heating boiler installation in a large apartment project.

Oxygen Scavenger Combats Boiler Tube Corrosion

. . . by keeping feedwater pH around 10 and by reducing metallic oxide sludge

BY A. JOHN FRIEDSAM
Maintenance Supervisor
Apartment Management Co.

and

ERIC R. WOODWARD
Chemical Engineer
Olin Mathieson Chemical Corp.

CORROSION is an ever present problem in steam or hot water heating systems.

Acidity in water has long been known as a major cause of metallic corrosion in heat generating systems. The most common acid in boiler feedwater is carbonic acid, produced by hydrolysis of carbon dioxide. Experience shows that the best safeguard against acidic corrosion is maintenance in the water of pH values in the range of 10 to 11.

Dissolved oxygen in boiler feedwater is also a major cause of metallic corrosion. In large plants such as those operated by public utilities for the production of electricity, in industrial boiler plants, and in marine boilers aboard ocean going ships, it is customary to remove most of the dissolved oxygen from the feedwater by mechanical deaeration.

Chemical Treatment Necessary

However, in the low pressure heating boilers found in large apartment projects, office buildings, schools, hospitals, and the like, the boiler feedwater usually is not mechanically deaerated. At ordinary atmospheric temperatures water is capable of holding in solution as much as 8 ppm of oxygen. Therefore, in the absence of mechanical deaeration, the chemical removal of oxygen from feedwater for low pressure heating boilers becomes a necessity if severe pitting type corrosion of metallic surfaces, boiler tubes, piping, radiators, and return lines is to be prevented.

An authority in the field of corrosion and boiler feedwater treatment has said that acidity and dissolved oxygen are the major causes of corrosion in steam generating systems. He says that pH control and the removal of dissolved oxygen comprise 98 percent of the required treatment in relatively pure water systems.

One chemical used as an oxygen scavenger in boiler feedwater treatment is hydrazine (N_2H_4). Upon complete oxidation, hydrazine is converted to nitrogen and water. This reaction may be represented in its simplest terms by the equation:

$$N_2H_4 + O_2 = N_2 + 2\,H_2O$$

Theoretically, 1 lb of hydrazine will remove 1 lb of dissolved oxygen from the feedwater; and the chemical is effective in that ratio. Since hydrazine is a liquid, no solids are added to the boiler.

Experience in the use of hydrazine in boilers used for the heating of buildings has shown great reduction in the quantity of total solids present in the boilers. This has reduced the frequency of blowdown required to maintain "total solids" within permissible limits, thus effecting economy of operation.

Hydrazine is a reducing agent, and this property enables it to hold to a minimum the amount of iron oxide scale formed in steam generating systems. It does this by reducing ferric iron oxide to ferrous iron oxide, which forms a thin black protective coating on the water side and steam side metal surfaces.

Report Use in Heating Boilers

A pioneer in the use of this treatment in low pressure heating boilers in the U. S. was the Apartment Management Co. of Irvington, N. J. In August 1954, George D. Robie, then maintenance manager of these large apartment house properties, had water analyses made showing the condition of the water in the three boilers in one of the buildings. Results showed 19 ppm sulfate in the hot water sample, and 26 ppm sulfate in the cold water sample. The other report showed very high iron content in samples of water from all three boilers:

No. 1 Boiler	30.5 ppm Fe
No. 2 Boiler	15.7 ppm Fe
No. 3 Boiler	41.6 ppm Fe

High copper pick-up was also shown.

It was decided to replace the former water treatment for these boilers with hydrazine. Tests showed that dissolved oxygen was present in the feedwater in the amount of 3.6 ml per liter. It was decided to start with a dosage of 5.4 ml N_2H_4 per liter of water. This dosage was achieved by adding 30 ml of 85 percent hydrazine hydrate to each of the three boilers once a week, based on 600 gal of water in each boiler when the water level was halfway up the gage glass. Addition of this amount of hydrazine raised the pH value of the water to 10.5, well within the desired range, and tests for residual hydrazine showed 0.1 to 0.2 ppm N_2H_4.

Extend Use of Treatment

By January 1955, the Apartment Management Co. was using hydrazine in a total of six boilers in two apartment houses. The pH of the boiler water was being checked twice a week and was found to be holding around 10. Samples of water taken from two boilers on the above date were found to be clear. Qualitative tests with potassium ferrocyanide indicated the absence of any appreciable amount of dissolved iron.

By February 1955, Mr. Robie was using hydrazine in 12 boilers in four buildings. In March 1955, water samples taken from two different boilers showed the following characteristics: pH 9.9, hydrazine 0.03 ppm in one case; and pH 10.8, hydrazine 0.03 ppm in the other.

The pH level was holding well, so that acidic corrosion would be kept at a minimum. However, hydrazine residual was low, so the dosage was increased to 40 ml of 85 percent hydrazine hydrate a week.

The use of hydrazine was continued for the rest of the heating season, and in May 1955 the boilers were opened for their annual insurance inspection. In those units where hydrazine had been used, the cleanliness, absence of corrosion, and reduction of metallic oxide sludge were such that the Apartment Management Co. decided to extend the hydrazine treatment to all boilers in all of their buildings. When this change is completed they will be using hydrazine in a total of 60 boilers.

Tube Life Lengthened

Robert Boswell, of the New Jersey Boiler Repair Co. which handles all boiler repair work for the Apartment Management Co., said, after inspecting these boilers, that boiler tube life will be lengthened greatly by the use of this treatment.

In June 1956, these boilers were opened for their annual inspection after using the hydrazine treatment for the past two heating seasons. The tubes were found to be clean and free from pitting on the water side. The water legs were clean and free of sludge. Flushing these with water left only a rusty colored patch on the floor after the flushing water had evaporated.

After a heating season on the previous feedwater treatment, a pailfull of sludge was taken out of each boiler. After the first heating season with hydrazine treatment, a handfull of sludge was taken from each. And, after two heating seasons on hydrazine, a small patch of iron oxide sludge on the floor is all the sludge there was in each boiler.

What is pH?

pH is the measure of the effective acidity or alkalinity of any solution. When pure water dissociates, equal numbers of hydrogen and hydroxyl ions are formed, and it is then referred to as "neutral," with a pH of 7. For an acid solution, the pH values will be between 0 and 7. For a basic solution, the pH values will be between 7 and 14.

Since pH is the logarithm of the reciprocal of the hydrogen-ion concentration, the pH values reflect only one tenth the actual changes in hydrogen-ion concentration of the solution. Practically speaking, a solution of pH 5 is 10 times as acidic as one with a pH value of 6.

The inspector said that in all of these boilers which he examined, everything was in perfect condition. The building superintendent said that the water legs were cleaner than they were the year before, and the boiler repair man further stated that internal examination of the boilers showed that hydrazine had reduced pitting to a minimum.

How to Apply Hydrazine

In low pressure heating boilers, hydrazine solution is most simply applied batchwise. A double valved piping connection can be fitted to the outside of the boiler at a convenient point above the water line. When adding hydrazine solution, the upper valve is opened and the correct amount of hydrazine solution is poured into the pipe. By closing the upper valve and opening the lower one the hydrazine is then dropped into the boiler.

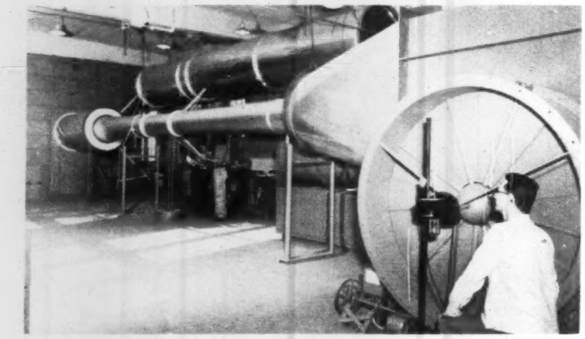
For use in industrial plant boilers, hydrazine solution is usually fed continuously into the feedwater line between the outlet of the deaerator and the intake of the boiler feedwater storage tank. With this arrangement a chemical proportioning pump is used to inject the hydrazine solution into the feedwater line against the back pressure of the flowing stream.

Since 85 percent hydrazine hydrate must be handled as a flammable material, a new 35 percent solution of hydrazine may be used in these applications. The latter has no flash point and no fire point. It is a colorless liquid completely miscible with water, and weighing 8.51 lb per gal.

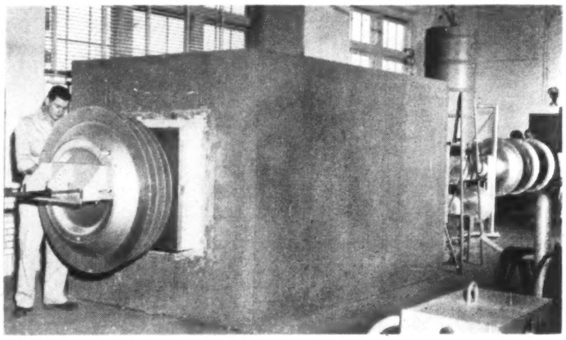
Although developed primarily for boiler feedwater treatment, this solution is equally valuable for water treatment in closed cooling systems of compressors and gas engines. This suggests the possibility of its usefulness in air conditioning systems where cold water is recirculated through a closed system. ǂ

Fan Testing Facilities Flexible to Meet Needs

. . . at Texas engineering experiment station



1 LARGE FAN TEST FACILITY, with plenum of welded plate, uses 17, 24, or 40 in. duct for fans 26 to 54 in. in diameter and air deliveries of 3000 to 60,000 cfm



2 SMALL FAN TEST FACILITY, with plywood plenum, is served by 6 or 13 in. duct for fans 12 to 26 in. in diameter and air deliveries of 300 to 6500 cfm

FACILITIES for studying the application, design, and evaluation of air moving devices of various kinds including kitchen and industrial fans, power roof ventilators, air washers, and evaporative coolers at the Texas Engineering Experiment Station, College Station, Tex., are available to the public on a fee basis, according to Louis J. Horn, at the station.

The station is a part of Texas A. & M. college. One of its objectives is "to investigate engineering and industrial problems of importance to the state."

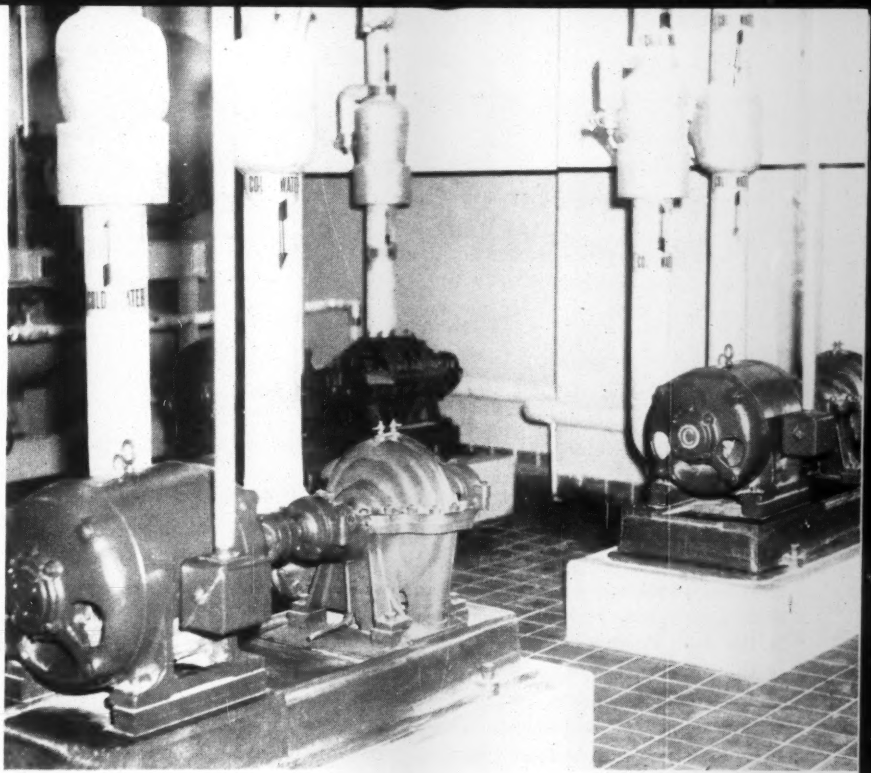
The fan testing laboratory can accommodate fans ranging from 12 to 54 in. in diameter and air deliveries of 300 to 60,000 cfm. Two separate sets of equipment currently available for tests of fans and power roof ventilators in accordance with Plates V, V-A, VI, and VI-A of the National Association of Fan Manufacturers' code include properly proportioned plenum chambers, supply ducts, Pitot traverse arrangements, supply fans, and dynamometers. The larger of these facilities is shown in Fig. 1. The plenum chamber is of welded plate construction. A propeller fan is shown ready for a test in which the electrical input to the motor is to be reported. The supply duct in place is 17 in. in diameter. Overhead in storage is a 40 in. diameter duct. A third duct 24 in. in diameter is also available.

The smaller facility, shown in Fig. 2, has a plenum chamber of plywood. Ducts with diameters of 6 and 13 in. are available for this equipment, which is used for fans 12 to 26 in. in diameter and 300 to 6500 cfm.

A portable dynamometer with a maximum capacity of 10 hp is available in the laboratory for use with either of these facilities.

Tests of axial fans and power roof ventilators in accordance with Plates VII, VIII, IV-A, and VIII-A of the NAFM code require either inlet or oulet ducts and are made on individual laboratory setups as needed. For larger units, dynamometer equipment rated up to 150 hp, is available. ǂ

When checking a pump in an air conditioning system — or when considering a compressor, fan, blower, or pump for other applications in heating, piping, and air conditioning — a good question to ask is . . .



Does It Have the Right Motor?

● Here's how to tell. Outlined here are the characteristics of various types of electrical motors and how to apply them correctly to integral equipment and components in heating, piping, and air conditioning installations.

BY H. G. NAFE
Manager, Sales Service Section
Century Electric Co.

THE DESIGN of any heating, piping, or air conditioning equipment is incomplete without the most careful consideration of the motor to be associated with it, since the performance and acceptance of the equipment in the field may well depend on the motor.

When applying any motor, perhaps the most important consideration is matching the driven equipment with a motor of the proper electrical characteristics. It is embarrassing to both the equipment designer and the motor manufacturer when the motor selected will not handle the application properly.

Must Consider Three Torque Requirements

To begin with, let's consider the three separate torque requirements of motors. These are locked rotor torque, pull-up torque, and breakdown torque. The National Electrical Manufacturers Association defines these important characteristics as follows:

1) Locked rotor torque is the minimum torque developed at rest, for all angular positions of the rotor, with rated voltage applied, and rated frequency.

2) Pull-up torque of an alternating current motor is the minimum torque developed by the motor during the period of acceleration from standstill to the speed at which breakdown torque occurs. For motors that do not have a definite breakdown torque, the pull-up torque is the minimum torque developed up to rated speed.

3) Breakdown torque of a motor is the maximum torque which it will develop with rated voltage applied and rated frequency without an abrupt drop in speed.

These three torque characteristics are equally important and should all be considered at the time the motor selection is made.

The general purpose motors being manufactured today are stamped with a horsepower rating that can be translated into certain basic and important information about the motor. This was not always the case; some 10 or 15 years ago the horsepower stamped on the nameplate of a general purpose motor could be very misleading.

Today fractional horsepower motors and integral horsepower single phase motors are rated in coordinated terms of horsepower, speed, breakdown torque, service factor, and starting current. Squirrel cage polyphase motors are rated in coordinated terms of horsepower, speed, breakdown torque, starting torque, starting current, service factor, and slip.

This clearly defined generally accepted method of evaluating motor performance is essential to insure intelligent design, efficient manufacture, and proper application of these general purpose motors.

Single Phase Motors Dominate Field

Single phase motors make up the largest percentage of all motors used in the heating, piping, and air conditioning industry. Since the current in a single phase circuit does not produce a rotating magnetic field, special devices are necessary to enable single phase motors to start. This makes a single phase motor more complicated than a polyphase motor, and more susceptible to trouble in the field. Furthermore, the power factor and efficiency of the single phase motor are lower than those of a polyphase motor of the same output. For these reasons single phase motors are used only in the smaller sizes or where polyphase power is not available.

The resistance split phase motor is the most widely used general purpose, single phase motor in the heating, piping, and air conditioning field. It is low in cost and handles belt driven fan and blower applications very satisfactorily. Motors of this type are designed with a main winding that has a relatively low resistance, and a phase winding or starting winding that has high resistance. This difference in resistances causes the current in the phase winding to lead the current in the main winding, and a starting torque results. At a predetermined speed a mechanical governor operates, opening a switch in the phase winding circuit and removing it from the line. The motor then operates as a single phase induction motor, with a main winding supplying the necessary power to the motor.

The starting torque of any single phase motor is proportional to the current in the main winding, the current in the phase winding, and the sine of the angle between these two currents. To meet industry standards the starting current of a split phase motor must be held to a certain maximum figure, and the angle between the main winding and starting winding current is small, usually in the order of 20 to 25 deg. These factors limit the locked rotor torque of the split phase motor to about 150 percent of full load torque. The breakdown torque will be about 200 to 225 percent, and pull-up torque about 135 percent. The power factor and efficiency will vary rather widely but will usually be around 60 percent.

Because of the starting current requirements, motors of this type are usually limited in size to 1/3 hp. Split phase motors are sometimes supplied in sizes above 1/3 hp, but only on special applications where the details of the motor requirements are carefully worked out by the design engineer and the motor supplier.

There is available another type of split phase motor other than the general purpose motor discussed above. This is referred to as a special service split phase motor.

This motor develops torque appreciably higher than the general purpose split phase motor, and does so at the expense of a higher starting current. Motors of this type have a starting current that is large enough to cause light flicker. It also tends to be noisier than the general purpose motor. Since virtually all the apparatus being installed by the heating, piping, and air conditioning industry today calls for automatic starting, these special service motors are seldom used. They are usually limited to manual start applications.

High Torque Provides Better Acceleration

Another type of split phase motor is the capacitor start, induction run motor. Motor design engineers were well aware of the possibilities of this type motor before 1920. However, it was not until the development of reliable low cost capacitors which came about in the late 1920's that it was possible to manufacture motors of this type on a large quantity basis.

The capacitor start, induction run motor has improved starting characteristics over the split phase motor. This motor differs from the resistance split phase motor in that a capacitor is placed in series with the phase winding. Displacement between the current in the main and phase winding is increased, since the addition of a capacitor to the phase circuit greatly improves the displacement. This greater displacement makes increased starting and pull-up torques possible; at the same time starting current is reduced. As on the resistance split phase motor, some type of centrifugal device is employed to open the switch in series with the phase circuit after a predetermined speed has been reached, in order to remove the starting winding and capacitor from the circuit.

Because of their higher starting torque, motors of this type are ideal for driving refrigeration compressors and other hard to start applications.

The increased pull-up torque enables these motors to bring connected loads up to speed more rapidly than motors of the resistance split phase type, and for this reason they are often used to drive heavy fans or blowers that require this additional torque for rapid acceleration. Motors of this type are regularly manufactured in sizes up to 20 hp, but in the heating, piping, and air conditioning industry are rarely used above 3 hp.

A low torque capacitor start, induction run motor is available in ½ hp and ¾ hp sizes, since split phase motors are not normally available in these higher horsepowers. The low starting torque motors handle fan and blower applications nicely, and accelerate loads of this type more quietly than do the capacitor start, induction run, high torque motors.

Repulsion Start, Induction Run Motor Efficient

The repulsion start, induction run motor starts as a repulsion motor and runs as an induction motor. It has a distributed winding in the stator, and a rotor that is built like that of a direct current motor. The rotor winding is connected to a commutator. When the brushes are short circuited by connecting them together and are set in the correct position, this motor is capable of developing a very high starting torque. A centrifugal device is provided that connects all the commutator bars together at a predetermined speed, thereby converting the armature to a squirrel cage rotor. This is essential if the motor is to have constant speed characteristics, since a drooping speed torque curve would result if operated continuously as an induction motor.

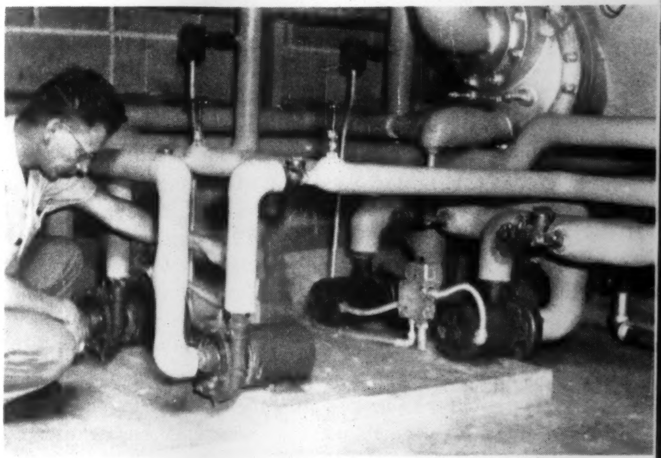
Motors of this type have the highest starting efficiency — starting torque per ampere — of any type single phase motor. They are also capable of developing a higher starting torque than the other type of single phase motors described. These features are particularly important on some applications, and should be considered when the driven load is hard to start or where low voltage is likely to occur.

It might be well to keep in mind the effect of low voltage on starting torque. The starting torque of any motor varies as the square of the applied voltage. Low voltage conditions do not affect the starting ability of motors of this type to as great an extent as it does the other type, single phase motors described. For, (1) these motors draw less starting current and hence do not lower the voltage as much, and (2), which is just as important, the greater starting torque that is available enables these motors to provide sufficient starting torque even at reduced voltages.

Permanent Split Capacitor Motors Gain in Use

Permanent split capacitor motors are used widely on fan and blower applications where the fan or blower can be either direct connected to the motor or mounted on the motor shaft.

It was only in recent years that permanent split capacitor motors were used in quantity, and the increased popularity of this type motor was due largely to the running current and power factor problems encountered in the air conditioning industry.



SMALL CENTRIFUGAL PUMPS, such as these of 50 gpm capacity, are among the wide variety of pumps used in heating, piping, and air conditioning systems. The vast majority use fractional and small integral horsepower motors

Since both the main and phase windings of these motors are designed so they can remain in the circuit at all times, it is not necessary to make use of any type of starting switches, centrifugal devices, or other similar accessories on these motors. The elimination of these parts results in a simpler and more trouble free motor. The oil filled capacitor which is placed in series with the phase winding of these motors is also capable of remaining in the circuit continuously.

Since the motor manufacturer does not need to include a centrifugal device in his design, a smaller and lighter weight motor results, and this is an important consideration on many heating, piping, and air conditioning jobs.

The starting torque developed by these motors is necessarily low. This torque is in the neighborhood of 30 to 40 percent of full load torque. Because of these torque limitations, the permanent split capacitor motors are not recommended for belt driven applications or other applications requiring considerable starting or pull-up torque.

By changing the voltage applied to these motors, speed reduction can be obtained. This can be accomplished by re-connecting the motor winding, or by using a transformer to provide a varying voltage. It is also possible to effect a speed change by the use of taped winding, a reactor controller, or an auto-transformer. To obtain satisfactory speed reduction, the motor should be fully loaded at top speed.

Use Three Main Types of Polyphase Squirrel Cage Motors

The simplest and most rugged of all motors are the polyphase squirrel cage motors. They are lowest in cost, highest in efficiency, and easiest to maintain. These motors are made in various designs to be suitable for the many applications to which they are applied. NEMA places polyphase motors of squirrel cage type in five classes: Designs A, B, C, D, and F. Only designs B, C, and F are of interest in heating, piping, and air conditioning work.

The NEMA Design B motor is the most widely used of all polyphase squirrel cage motors, and is suitable for most applications. It will accelerate to full speed any load it is able to start, has a slip of 5 percent or less, and is referred to as a normal torque, low starting current motor. Motors of this size draw 14.5 amp per hp at 220 volts, locked rotor current in sizes 30 hp and larger. Running currents in these sizes at 220 volts would be about 2.3 amp per hp.

The NEMA Design C motor is a high starting torque, low starting current motor that is frequently used on refrigeration compressors. Motors of this design make use of double cage rotors. The inner cage has a low resistance and high reactance, while the outer cage is constructed to have a high resistance and low reactance. During the starting period the greater portion of the starting current is carried in the outer cage, and this enables a high starting torque to be developed. As the motor accelerates, the current shifts to the low resistance inner cage. The breakdown torques available for motors of this design are slightly less than those of the Design B motor. These motors will withstand full voltage starting, and have locked rotor currents of the same as those of Design B motors.

The NEMA Design F motor is a low starting current, low starting torque motor that can sometimes be used on applications requiring limited locked rotor current. It is often possible to use motors of this design to meet certain power company regulations as to allowable motor starting current, and thereby avoid high cost motor control that would have to be employed with polyphase motors of other designs. Motors of this design are generally available only in from 30 hp to 200 hp, since this is the range that usually causes difficulty due to excessive starting current. The starting current of these motors is 9 amp per hp at 220 volts.

To obtain a motor with this low starting current, motor torques must be sacrificed. Therefore, the starting and breakdown torques are low. Because of these limited torques, such motors should only be used on applications that start easily and can be brought up to speed rapidly. Blowers, fans, and compressors operated with unloaders can often be handled nicely by Design F motors.

Wound Rotor Motors Provide Adjustable Speed

Wound rotor motors are generally used where adjustable speed is required, and only alternating current is available, or where particularly high starting torque and low starting currents are required. Motors of this type have stator windings similar to those used in squirrel cage motors. The rotor, however, is provided with an insulated winding with leads connected to collector rings. Carbon brushes ride on these rings and they can be connected to an external resistance. Drum controllers of the manual type or magnetic contactors are used to cut this resistance out of the circuit with each successive step of the control. In the larger sizes only magnetic contactors are used.

Where speed adjustment is required, controllers can be used to obtain varying adjustable speed over approximately a two to one range. Speed reductions of more than 50 percent give unstable operation and are not recommended in the average application. It should be remembered that at any point of adjustment the speed will vary with any change in the load. By proper setting of the controller the initial starting current can be reduced to full load values.

When wound rotor motors are used to obtain adjustable speed operation, the proper controller resistors must be selected. The type of resistor used depends on the application, since constant torque loads require different resistors than do variable torque loads.

The starting torque and breakdown torque of polyphase motors vary as the square of the applied voltage.

The table below points out the effects of voltage changes on motors of this type:

	110 Percent of Rated Voltage	90 Percent of Rated Voltage
Torque (starting and breakdown) change, percent	+21	−19.0
Speed change, percent	+ 1	− 1.5
Power factor change, percent	− 3	+ 1.0
Temperature change, C	− 3 to 4	+ 6 to 7

How Long Will Insulation Last?

Virtually all of the motors used on heating and ventilating equipment are constructed with Class A insulation. This insulation involves the use of cotton and resinous coated wires with various types of paper, linen, or cotton materials for slot insulation and phase insulation. The entire winding is usually covered or impregnated with an insulating varnish. Insulation of this class is good for a maximum hot spot temperature of 105 C (221 F). For more severe service, Class B or Class H insulation is available.

High temperatures have a definite effect on organic insulation. It is generally accepted that the life of organic insulation is cut in half with each 10 C rise in temperature. A motor with a 40 C or 104 F rise operating in an ambient temperature of 40 C might last 20 years. By changing the rise to 50 C, the life expectancy of the insulation becomes 10 years. Raise it to 60 C and the life expectancy goes down to 5 years.

The foregoing discussion of the most popular types of induction motors employed in heating, piping, and air conditioning is only an introduction to the great fund of information available about motor types and their applications. Additional details are available from any motor manufacturer. ‡

In another article to be published soon in HPAC, the author will discuss the application of motors to hermetically sealed compressors, open type reciprocating compressors, centrifugal compressors, fans, blowers, and pumps.

Welded Polyethylene Duct Systems Resist Corrosion, Cut Costs

. . . for exhausting alkali and acid fumes

BY J. A. NEUMANN
President and Director of Research
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and

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Rectangular and round ducts, plus standard and custom fittings, as well as components such as centrifugal fans, all available in various sizes, are fabricated by hot gas welding into ventilation systems for severely corrosive service. Tanks, fume scrubbers, and other equipment are also constructed of this structural grade plastic. Light in weight, it has high impact strength.

VENTILATION DUCTWORK of structural grade polyethylene for carrying fumes from an alkali wash bath and hydrochloric acid pickling bath is solving the problem of severe corrosion and costly replacement that previously plagued a midwestern manufacturer. The installation, which has given satisfactory service ever since it was made four years ago, is shown in the picture above.

Each bath has a three sectional hood and a 14 in. diam exhaust stack connected to an available stainless steel exhaust manifold. Capacity of the system is from 7000 to 8000 cfm. To date, no corrosion has been observed. Although the hot caustic is often carried over to the ductwork, even this direct contact has had no effect.

Polyethylene Is Very Adaptable

Various physical properties of polyethylene are presented in Table 1 but this does not tell the complete story. Polyethylene is light in weight. It is highly flexible, and it possesses a high impact strength, resisting dents and cracks in service.

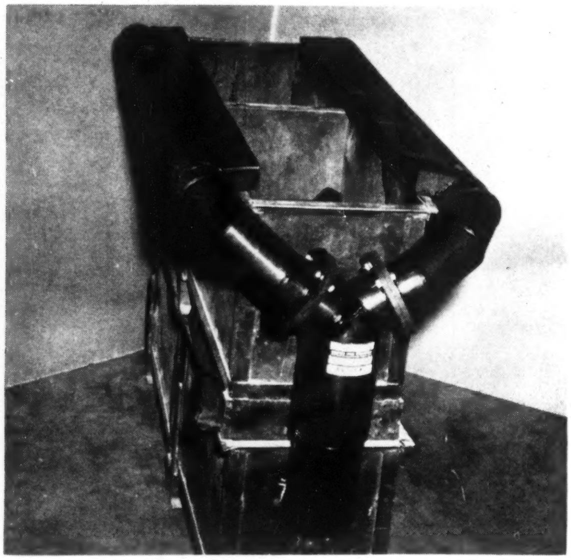
Ducting fabricated from seamless cast polyethylene tubing has smooth inside surfaces and low frictional values.

Ducting can be safely used at temperatures as high as 175 F. In certain cases, ducting can be used at temperatures as high as 195 F with high gas velocity.

Chemically Very Resistant

In addition, polyethylene is unexcelled in chemical resistance by any of the other common plastic materials of construction. Polyethylene is unaffected at room temperature by most corrosive reagents, and has no known solvent. Hydrochloric sulfuric, nitric, and hydrofluoric acids can be handled conveniently with this material. Concentrated caustics, such as ammonium hydroxide, potassium hydroxide, and sodium hydroxide do not affect polyethylene. Dilute aqueous acids, bases and salts can be

2 HOT GAS WELDING is common method of joining polyethylene duct or sheet sections. Adaptability to this method has been big factor in polyethylene's growth


3 DOUBLE LATERAL EXHAUST DUCTING of 6⅝ in. OD polyethylene — of all welded construction — attaches directly to a polyethylene duct line

handled effectively without the slightest corrosive indication. Polyethylene is not attacked by oxidizing chemicals such as potassium permanganate or hydrogen peroxide (30 percent) at room temperature. Polyethylene has been used successfully in fluorine and hydrofluoric acid installations at normal temperatures, although liquid and wet gaseous halogens will attack polyethylene slowly in the cold.

The chemical and physical properties of polyethylene remain substantially unchanged with age under indoor conditions. However, in the presence of ultraviolet light, as encountered outdoors, carbon pigmented polymers are required to combat the tendency for ultraviolet degradation. Carbon pigmented polyethylene has been used successfully over long periods of time under outdoor exposure.

Weather conditions such as humidity changes or constant immersion in salt water or salt spray do not affect polyethylene.

Fabricate By Hot Gas Welding

The adaptibity of polyethylene to hot gas welding has been a major factor in the growth of polyethylene as a recognized construction material. Weld strength values of 90 percent of the tensile strength of the parent material are now standard.

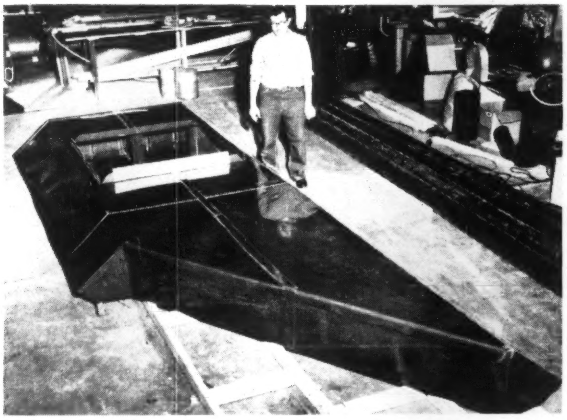
The principle of hot gas welding of polyethylene is similar to that of oxyacetylene welding of metals. The open gas flame which furnishes the welding heat in the latter process is substituted by a stream of heated inert gas such as nitrogen or argon. A filler rod employed in this process is usually of identical composition to that of the parent material. Various sizes and shapes of filler rod depending upon a particular construction are used. In view of its sharply-defined melting point, polyethylene lends itself well to this versatile and reliable joining method. Thus, it is not only a material which is an excellent chemical barrier, but also one which is readily fabricated into shapes and structures limited only by the imagination.

Structural components for polyethylene fabrication include sheets, rods, pipe, and centrifugally cast tubing. Sheets are available in sizes up to 2 by 48 by 72 in. Rods can be obtained up to 10 in. in diameter, and ducting and piping are available in diameters up to 27½ in.

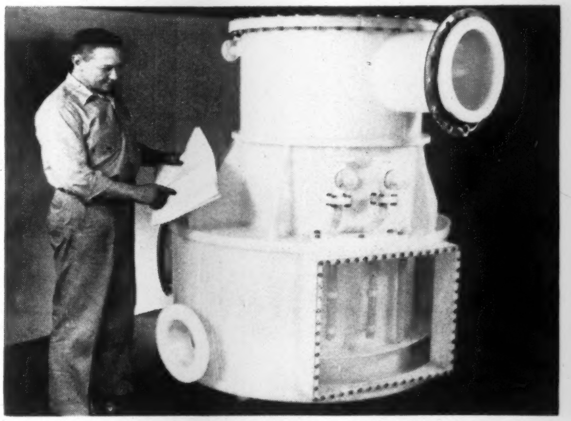
Some of the standard sizes for seamless centrifugally cast tubing

TABLE 1—STRUCTURAL GRADE POLYETHYLENE has many properties, as listed here, that make it adaptable to ductwork

Property		A.S.T.M.	Value	Units
Tensile strength	−70 F	D638—52T	4750	lb per sq in.
	73 F	D638—52T	1900	lb per sq in.
	158 F	D638—52T	950	lb per sq in.
Elongation	−67 F	D412—51T	60	percent
	73 F	D412—51T	600	percent
	158 F	D412—51T	600	percent
Modulus of elasticity	73 F	D638—52T	35,000	lb per sq in.
Stiffness	−67 F	D747—50	230,000	lb per sq in.
	73 F	D747—50	27,000	lb per sq in.
	158 F	D747—50	8000	lb per sq in.
Shear strength	73 F	D732—46	2750	lb per sq in.
Impact strength, izod.	−40 F	D256—47T	0.8	ft lb per in.
	73 F	D256—47T	did not break	ft lb per in.
Hardness Shore		D676—49T	C81.D48	
Thermal conductivity		Cenco-Fitch	1.75	Btu per hr per sq ft F per in.
Softening point, Vicat			201	F
Brittleness temperature		D746—51T	<−105	F
Flammability		D635—44	0.94	in. per min
Dielectric constant, 60 cycles to 100 megacycles		D150—47T	2.3	
Power factor, 60 cycles to 100 megacycles		D150—47T	0.0005	
Specific gravity		D792—50	0.92	
Water-absorption		D570—42	0.014	percent



4 WELDED FUME HOOD 17 ft long by 6 ft wide, with 4 ft sq opening for transition piece and riser stack, is example of polyethylene's adaptability



5 FUME SCRUBBER for use in contact with hydrochloric acid is 4 ft in diam by 5 ft high. Flow rate through this unit is 2500 cfm at 1½ psig

available in structural grade polyethylene are listed in Table 2. Standard size data presented in this article was compiled by R. F. Roth, of the American Agile Corp.

Special sizes in centrifugally cast tubing are also available. Wall thicknesses up to 1½ in. are available for special applications. Fig. 2 illustrates the hot gas welding technique being applied to various ducting sections.

Use Standard, Custom Fittings

Several standard duct fittings are available in structural grade polyethylene.

Ells, tees, reducing tees, and collars are welded directly from centrifugally cast tubing. Transitions, weather caps, and flanges involve the use of sheet in addition to centrifugally cast tubing. Due to the flexibility of the hot gas welding method, many thicknesses and diameters can be produced in standard fittings.

In addition to standard fittings, custom fittings of various types are available, such as common expansion joints and expansion joints of the sleeve type.

Weld Centrifugal Fan Rotors

A vital part of any corrosion resistant duct system is the centrifugal fan, which may be constructed of polyethylene.

Blowers having capacities up to 15,000 cfm have been fabricated. Large volume fans generally employ welded rotors. In smaller sizes, one piece molded rotors are now used.

Weld Hoods From Sheet Stock

Hoods employed in polyethylene ventilation systems are usually welded from polyethylene sheet stock. Although hood requirements vary considerably, it has been found that certain type hood constructions are most popular. The three most popular hood types — the rear hood, lateral slotted hood, and the canopy hood — are shown in Fig. 3. In addition, available standard sizes of tapered rear hoods are listed.

Install for Corrosive Service

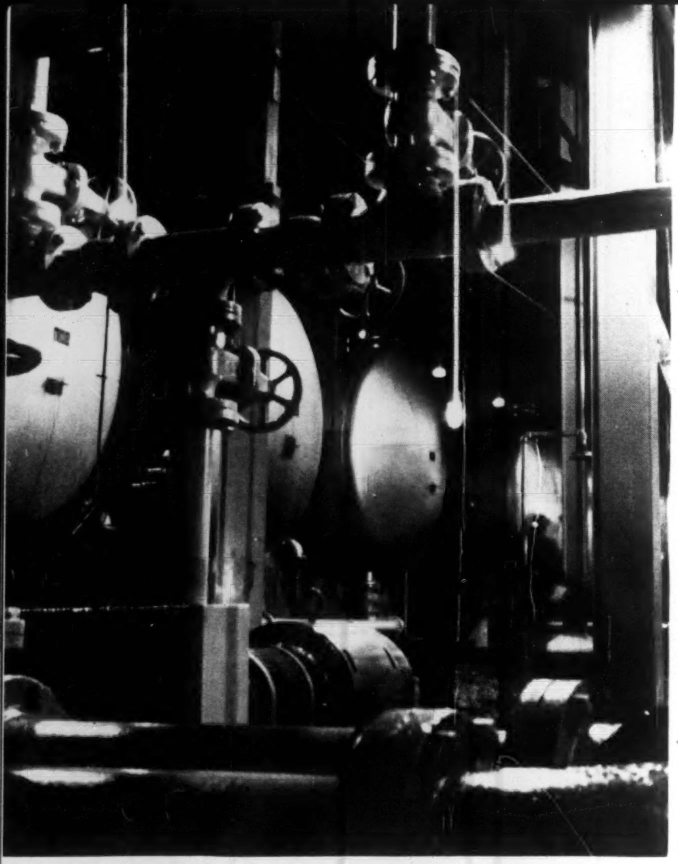
Polyethylene ducting and components find their greatest applications in installations handling corrosive fumes. A double lateral exhaust ducting and hood of 6⅝ in. OD polyethylene, all welded construction, is shown in Fig. 4. This hood is attached directly to a polyethylene duct line. Downdraft hoods of this type are particularly applicable in polyethylene since condensation collections in polyethylene ducting do not provide any corrosion problem.

Polyethylene has also been used in the construction of fume scrubbers. One recent installation, shown in Fig. 5, is used in contact with hydrofluoric acid. It is 4 ft in diam by 5 ft high. The flow through this unit is 2500 cfm at 1½ psig. The shell and gusset is of ½ in. thick polyethylene and the end plates and flanges are of ¾ in. material with transparent windows. The piping and globe valves are also polyethylene.

These are but a few of the applications in which polyethylene has solved corrosion problems. ⧧

TABLE 2—SEAMLESS CENTRIFUGALLY CAST DUCTS of structural grade polyethylene is available in the following standard sizes

Duct Size ID in.	OD, in.	Wall thickness, in.	Weight per ft, lb	Standard length, in.	Estimated burst pressure, psig, @ 75 F
3⅝	4	3/16	0.91	48	185
4⅜	4¾	3/16	1.08	48	155
5¼	5⅝	3/16	1.28	48	135
5¼	5¾	¼	1.73	48	155
6⅛	6⅝	¼	2.00	96	150
8	8½	¼	2.65	96	110
10	10½	¼	3.30	96	88
12	12½	¼	3.85	96	70
14	14½	¼	4.50	96	65
16	16½	¼	5.00	96	60
18	18⅝	5/16	6.00	96	65
20	20⅝	5/16	7.75	96	60
22	22⅝	5/16	8.55	96	55
24	24¾	⅜	11.60	96	60
26¾	27½	⅜	13.20	96	50



The cost of piping maintenance in industrial plants may be reduced by giving attention to several key factors. Among them are installing the system for ease of maintenance and ease of operation and evaluating the importance of annual upkeep. Four other factors were discussed previously by the author in the November and December 1956 HPAC's.

BY ROBERT J. PINSKE

How to Cut Maintenance Costs Of Industrial Piping Systems

5. Install Piping System for Ease of Maintenance

WHENEVER possible, all piping should be installed in locations and positions that will allow ample room for the proper maintenance in the future. Too often the pipe, valves, and fittings are grouped together in inaccessible places such as trenches under the floor, one corner of a tunnel or wall of a building, and over equipment where the atmosphere may be extremely hot. Piping maintenance performed under such conditions is extremely time consuming, costly, and in some cases, the shutdown of a vital part of a plant is necessary. The installation of bypass valves and lines around all types of traps, regulators, and controls will permit maintenance work to be performed during regular working hours. Otherwise, if bypass connections are not installed, the piping system must be shut down, thus stopping production, or the maintenance work must be performed at premium rates.

Valve Stems Should Be Up

All valves should be installed with the valve stems in the top position, 45 deg from the vertical top position, or at an angle of 90 deg. To install valves with the valve stem in a down position, regardless of the angle, will in all cases prevent the proper operation of the valves and increase the amount of maintenance required.

Place Hangers Close to Valves

Piping must be properly supported to prevent leakage at flanges and screwed connections. An amply strong pipe hanger or support at 10 ft intervals is considered good practice for the average ordinary industrial plant installation, but the spacing will vary considerably with the size and type of the piping system. The pipe hangers and supports must be placed close to the valves to prevent the distortion of the valve seats with resultant leakage.

Mr. Pinske is sales manager, heating and industrial division, Warren Barr Supply Co. Previously he was a power plant engineer with Crane Co.

Use Standard Length Nipples

Wherever practical, the traps, strainers, reducing valves, etc. should be made up with standard length nipples to facilitate their removal and replacement with minimum interruption to service. When one of these specialties is removed from service, it can be taken to the maintenance shop, where as a spare time venture it is rebuilt and put in stock for future use.

Special Bench Aids Repair

To facilitate the repair of these pieces of equipment, a special workbench and test station with all the required equipment and spare parts is required. This facility helps reduce overall piping costs because it insures the use of proper tools and spare parts, provides adequate test equipment, and makes it possible to assemble enough of one type of work to assure economical operation. In the field, the use of centrally repaired equipment will reduce equipment failures and emergencies.

6. Install Piping for Ease of Operation

GOOD DESIGN precludes the installation of all valves in the most convenient location for operation. Some valves must be put in places which are relatively inaccessible with relation to the normal level of operators. The amount of time which operators must spend in getting to such valves may cumulatively entail costs which should be challenged. The frequency of operation is, of course, pertinent in consideration of plans to save this time. The addition of a chain wheel will save time lost in valve operation. The extension stems on overhead valves provide a means of operation at a lower level. For larger valves below the operating floor level, a floor stand with an extension stem is indicated.

If such manipulation of valves is frequent to a point of burden, then consideration of mechanical operation is justified when seeking ways to reduce costs. Mechanical operation of remote valves involves cylinder operation or motor operation, the latter being liquid, air, or electric motors. The ultimate choice of one of these four types of mechanical operations depends on a number of individual conditions, relative costs, power available for operation, and the time cycle for opening or closing the valve.

Survey Remote Operation

When valves are remote with respect to the normal location of personnel, a survey will disclose the time consumed and other disadvantages in valve operation. Additional advantages may accrue through the ability to manipulate motor-operated valves from any one of several points. The high unit cost of labor for operating remote valves may easily be sufficient over a period of years to justify an outlay for motor operators, considering only the relative cost of the latter amortized over their normal life expectancy. The comparative savings alone can often justify such expenditures, although the advantages of increased safety and speeding up operations must not be overlooked.

Another large source of waste of man-hours is the inability of an operator to know if a nonrising stem type valve is opened, closed, or throttled to the desired opening. An operator may spend many man-hours a year in trying to throttle the flow of a liquid or gas to the desired amount. A throttle valve is usually opened more than required by the operator, to assure himself of sufficient flow through the line. This type of operation will result in a waste of the material flowing through the line. Inexpensive tags or indicators should be attached to the valve bonnet.

7. Evaluate Importance of Annual Upkeep

THE UPKEEP of a plant piping system exerts a far greater influence on the output and economy of an industrial plant than most plant managements realize. Some plant managements seem to have the idea that once the piping system is installed and in operation it can be completely forgotten. The importance of piping upkeep will be realized, if the base amount of pipe, valves, fittings, and various controlling devices in the average industrial plant is thoroughly considered.

The original piping material cost of an industrial plant is from 2 to 4 percent of the total cost of the plant. The cost of labor to install the piping is 4 to 7 percent of the total cost of the plant. The total cost of labor and material for the piping system is, therefore, 6 to 11 percent of the original cost of the plant. The piping systems of all industrial plants are constantly undergoing changes and additions, thus increasing the investment up to 25 percent, in some plants.

The most efficient and economical method of performing piping maintenance is by following an organized set of piping standards. These standards would be for use throughout the entire plant. The most valuable result of the standards often proves to be a reduction in engineering time.

The standards, however, are not static. As with any vital operating tool, they must be changed as improvements are made.

From the maintenance man's point of view, the standards perform an important function, in supplying much of the information that previously had to come from years of experience and instruction. The emphasis of the maintenance supervisor's job is changed from that of a technician to that of an inspector and a record keeper. He inspects the jobs to see that the standards are maintained. Accurate records assure an ample supply of standard materials ready for routine or emergency use.

In effecting piping maintenance and piping rearrangements, it has proved imperative that mechanics know not only what the standards specify but also the reasons underlying the instructions. Without this understanding, it would be impossible to enforce the rules, for some of the plant's pipe fitters may have received their training in plants where getting around immediate difficulties is usually more important than maintaining any semblance of orderly piping. The use of proved, modern equipment and standardized layouts, with provisions for alteration and expansion, are vital on small, simple jobs as well as on large, complex jobs.

How to Cut Wasted Time

Without the use of piping standards in a plant, a great waste in man-hours usually results. In one case, two pipe fitters sent out to change a nipple or union in a small pipe line left the shop to go and inspect the job. Then they returned to the shop or stockroom for the necessary fitting. Returning to the job site, they spent 10 to 15 min in performing the repair work. The time they spent walking around to procure the fitting took 1½ hr per man, or a total of 3 man-hours. With a labor and burden rate of $3.75 per hour, $11.25 was spent to do a $2.00 repair job. The small industrial plant can control this waste much better than a large plant because of the difference in plant area. Many large plants are lax in controlling the amount of wasted time, the survey showed.

To help reduce this waste of time, small portable workbenches are used in some plants. The portable workbenches are equipped with the necessary tools, vises, and a small varied quantity of standard valves and fittings. Pipe fitters are dispatched from job to job, with the elimination of most of the wasted time.

Repair Vs Prevention

In general, industry employs either of two forms of piping maintenance, corrective and preventive. Corrective maintenance is usually a rush job and only temporary in nature because the piping equipment commonly is in no way improved, other than repairing the damage. Piping repair work performed in this manner usually repeats itself again and again. The excessive cost of following this policy of maintenance is reflected in records kept by a few of the plants surveyed. These records include production downtime, reduced service life of piping equipment, and the cost of upsetting maintenance schedules.

Preventive piping maintenance, however, keeps breakdowns to a minimum, with the inevitable result of more efficient and more economical operation, reduced maintenance costs, less time lost due to unnecessary breakdowns, and increased service life of equipment. In the past 10 years, some of the large steel companies, refineries, and industrial plants have converted from breakdown to preventive piping maintenance with excellent results. Sufficient cost data has been accumulated and has indicated savings and other benefits much greater than originally anticipated. For years, many managements have overlooked available methods to reduce and control piping maintenance expenditures.

Frequently, cost comparisons are made between two plants, one following breakdown piping maintenance and the other preventive piping maintenance. Occasionally, the plant using breakdown piping maintenance will show a lower operating cost. However, this type of comparison is misleading. To make repairs only when a breakdown occurs may result in lower piping maintenance costs over a short period of years. Eventually, only major repair and overhaul, at great expense, can give anywhere near the anticipated equipment service life. Moreover, such major expenditures will result in greater average maintenance cost per year, than for preventive piping maintenance where the annual cost is on a more uniform basis.

Sell Maintenance Program

One of the important functions of the plant or maintenance engineer is to advise management on the most economical and most efficient piping maintenance program. Therefore, it is also his duty to sell management on the soundness and benefits of preventive piping maintenance. Efforts to use preventive maintenance by selling the pipe fitters first and management last only encourages failure.

After management fully approves starting an organized program for preventive piping maintenance, the plant or maintenance engineer should make every effort to sell the program in advance to his piping maintenance foreman and group leaders before installing any phases in which the pipe fitters take part. Success depends upon the coordinated efforts of everyone, from top management down to the pipe fitter. It is also important to review the program in advance with union representatives, so that possible complaints and grievances will be forestalled.

Management must also review the entire program with the top production-supervisory personnel to acquaint them with the objectives. A fact that must also be recognized is that production departments are very familiar with the manufacturing equipment and with the capacity and required volume of services flowing through the piping system which is necessary to maintain maximum production under normal operating conditions. The production supervisors also know the weak spots in their production operations. Therefore, their cooperation and help are essential to assure the completeness and workability of a sound preventive piping maintenance program. ╪

Other articles by the author on piping maintenance will be published in future issues of HPAC.

The Law and Your Profits

BY WILLIAM HURD HILLYER

Specs Overlap; Contractors Feud

OPEN SPACES in specifications of subcontracts often contain traps for the unwary. The case which follows underscores the importance of keeping proper books of account that can be adduced as evidence.

Under the general contract of Primar Construction Co., for an aircraft shop building at Aquila Air Force Base, A. Gressif, Inc., was the heating subcontractor and E. Lektro Co. was the electrical subcontractor.

The heating firm's $200,000 subcontract was awarded for "certain mechanical work"—heating and sheet metal installations—as set forth in detail and as referring to certain sections of the specifications. Four days later the electrical concern was given a subcontract to do "all electrical work, interior and electrical distribution system, aerial complete, according to plans, specifications and addenda" including "motors, motor controls, and switchboards" for the agreed sum of $69,000.

Before long, certain clauses in the heating firm's subcontract began to provoke controversy. As an example, there was the phrase "electrical work as required under mechanical work" set forth in a series of items that the heating firm was to furnish.

As the construction proceeded the superintendents of the respective subcontractors widened this dispute as to which company should supply certain items of electrical equipment namely, starting generator set, rheostat, and control panels. Smith, superintendent for Lektro, refused to furnish these items, and the work was held up. He laid the matter before the prime contractor's superintendent, who thereupon told Jones, the heating company's superintendent, that it was Gressif's duty to supply the items, and if that company did not do so, their payment would be withheld. Thus coerced, the heating concern furnished the items and they were installed by Lektro.

When Jones (the heating superintendent) delivered his equipment he insisted that Smith (the electrical superintendent) give him a purchase order for it, which Smith declined to do. Jones thereupon prepared a receipt, which Smith signed. It read as follows:

"We have received various starters and control panels, accessories for spray booth and air compressor on aircraft shops . . . pending further classification of the specifications".

However, on the same day that Smith prepared the form of receipt, Jones, the heating superintendent, wrote to an E. Lektro executive stating that he and the superintendent of the electrical subcontractor had concluded "it was beyond us to decide, and that rather than hold up the job I would move the panel up there and he would sign a tag showing he had received it, and that the clarification of the specs would be taken up by the companies."

The heating company's superintendent added that, about 20 minutes after he and Smith had reached this conclusion, General Manager Jackson of the Primar Construction Co. called up, saying that the electrical firm's superintendent was in his office and suggesting that Jones come over, as the three of them "should get together on a deal."

"Did you refuse to give Smith the switchboard?" Jackson inquired. Jones replied, "No, their superintendent said he would sign for it." Jackson then announced that he would stop the heating company's payment. In his opinion it was that company's work.

Some weeks later the heating subcontractor sent the electrical subcontractor four invoices totaling $6000 and showing that 15 percent overhead and 10 percent profit had been added to each of the four sets of items. The heating firm sued the electrical firm for merchandise sold and delivered.

The trial court awarded the heating subcontractor $4800, and the electrical subcontractor appealed. Lektro argued on appeal, Gressif had already been paid for the merchandise, since in making up his bid he had estimated the cost of the disputed items in arriving at his lump sum proposal, a contention partly supported by the testimony of the heating company's own superintendent. Lektro furthermore attacked the finding that the material had cost Gressif the amount awarded by the lower court, no books of account having been introduced in evidence.

The "somewhat conflicting" testimony was resolved by the higher court in favor of the heating subcontractor, whose judgment against the electrical subcontractor was allowed to stand. What nearly cost the heating man his case, however, was the absence of proper books of account. ‡

WILLIAM HURD HILLYER, *author of this regular feature, is a contributor to a number of banking and financial publications and has written several books on business. He has an extensive practical legal and financial background.*

This series presents actual cases. Naturally, laws vary in different states. All names are fictitious.

Looking at Electric Heating

. . . for today and tomorrow

SHAKESPEARE said in *As You Like It*, "sweet are the uses of adversity." I agree, but am coming more and more to appreciate how sweet are the uses of that still unknown entity, electricity. We have learned how to produce it. We realize that it always has had to do with our being alive, yet we do not know, in terms comparable with physical substances, just what is this invisible force.

Realization of the profound influence of electric energy in our lives comes gradually to many of us. A protective sense, aided by electricity, causes one to jerk his burning finger away from a hot stove.

Some other influence, possibly electric, enables me to call up from records in my brain the memories of experiences that show what to avoid or to encourage.

I think of the business transactions far and wide that I conclude in seconds by telephone, compared with the time and stress that would have been required if I went to the barn, saddled my horse, and plodded to the hitching post in front of my client's office.

Perhaps it is not too far into the future when we will look back and recall the time when we burned precious fuel to change water to steam. with which to gain power to force two magnets apart, so as to generate an electric current. This force could be transmitted through metal conductors at high pressure at what we hoped would be little loss. Now we approach the possibility of producing electric energy directly from something without steam turbines, possibly the sun.

Production of electric energy by falling water has long been accomplished. The energy transmitted, as from Niagara Falls, not only turns productive machines such as saws and lathes, but also freezes water, cools living rooms, and develops intense heat for metal processes.

Anyone with strength to turn a crank can generate a small electric current, at no loss except the heat and moisture from his body.

These thoughts influence me to stand over with the men who build and operate the public service electric companies.

They have competed since the beginning against other firms who depend on fossil fuels and have held their own, even though most of them must, in the slow improvement of the art, depend on coal or oil.

Electric energy may be easily converted to heat, as by the filament of a light bulb, which resists the flow of energy until it becomes red hot.

Electric energy successfully enters a building over three well insulated wires. It may flow through resistance conductors imbedded in the walls, ceiling, or floor of a room and heat the room by radiation and convection.

Electric energy may compress a refrigerant gas until the gas changes state to liquid, and in doing so releases and rejects the heat of vaporization. This heat, due to change of state, may be wasted, but comes more and more to be conserved by using the warm condenser water to heat buildings. A unit of electric energy, so applied, gives off several times more heat than can be realized from forcing the energy through a resistance type conductor. ∓

SAMUEL R. LEWIS, *consulting mechanical engineer and a member of HPAC's board of consulting and contributing editors, comments informally each month on practical heating, piping and air conditioning problems.*

Construction Slowdown? November Awards Drop

. . . "further progress moderate"

CONTRACT awards for future construction in the 37 states east of the Rockies in November 1956 — latest figures available — totaled $1,689,261,000, a decrease of 6 percent compared to November 1955, according to F. W. Dodge Corp.

November awards by the major construction categories show a new dollar volume record in nonresidential category of $729,642,000, up 10 percent compared to November 1955. Heavy engineering awards at $334,906,000 were 18 percent below November 1955.

The 11 month cumulative total of awards established a new dollar volume record of $22,836,733,000, an increase of 5 percent over the corresponding 1955 period. ∓

HPAC DATA FILE

Presented in this and the following seven pages are tables, charts, and graphs containing information and data often needed in designing, installing, operating, and maintaining heating, piping, and air conditioning equipment in large buildings. Simplified in form for quick reference, this data file will serve as a valuable tool for consulting engineers, mechanical (heating, piping, and air conditioning) contractors, and plant and building engineers.

Hot Water Heating Pipe and Tube Sizing

Pipe sizing tables for one pipe and two pipe forced circulation hot water heating systems from an article by George D. Beals in September 1948 HPAC.

Capacities in sq ft EDR for standard weight steel pipe

Pipe size, in.	Gpm	Average radiator water temperature, F				Friction head, ft per ft of pipe
		215	197	190	175	
		Emission rate per sq ft radiation, Btu per hr				
		240	200	180	160	
1	9.43	340	410	450	510	0.068
1¼	16.3	590	710	790	885	0.045
1½	22.4	805	965	1075	1210	0.036
2	36.7	1320	1580	1760	1980	0.027
2½	52.2	1880	2260	2500	2820	0.021
3	80.6	2910	3490	3880	4360	0.016
3½	107.9	3880	4650	5170	5820	0.013
4	139.	5000	6000	6670	7500	0.011
5	218.5	7880	9450	10500	11800	0.009
6	315.5	11370	13650	15150	17010	0.008
8	558.	20100	21160	26800	30200	0.006

For a temperature drop of 30 F in the system, the above capacities may be increased 50 percent.

Valve and riser sizes for steel pipe

Size in.	1st fl.	2nd fl.	3rd fl.
½	90	60	50
¾	150	100	90
1	250	175	160
1¼	500	350	320

The riser capacities given above are for one pipe or two pipe systems, upflow or downflow, and with a flow fitting on the return end only of one pipe systems.

Capacities in sq ft EDR for copper tubing, type L, hard temper, 250 lb WP

Pipe size, in.	Gpm	Average radiator water temperature, F				Friction head, ft per ft of pipe
		215	197	190	175	
		Emission rate per sq ft radiation, Btu per hr				
		240	200	180	160	
1	9.01	325	390	430	485	0.045
1¼	13.72	515	620	690	775	0.035
1½	19.45	720	865	960	1080	0.029
2	33.8	1250	1500	1665	1875	0.020
2½	52.3	1925	2310	2570	2890	0.015
3	74.4	2750	3300	3670	4120	0.013
3½	100.8	3700	4450	4940	5550	0.011
4	130.8	4790	5750	6400	7200	0.009
5	204.	7450	8950	9950	11200	0.008
6	285.5	10670	12800	14200	16000	0.007
8	512.	18700	22400	24900	28000	0.005

For a temperature drop of 30 F in the system, the above capacities may be increased 50 percent.

Valve and riser sizes for copper tubing

Size in.	1st fl.	2nd fl.	3rd fl.
⅜	45	30	25
½	75	50	40
⅝	110	75	65
¾	125	85	75
1	225	160	145
1¼	425	300	275

The riser capacities given above are for one pipe or two pipe systems, upflow or downflow, and with a flow fitting on the return end only of one pipe systems.

High Temperature Hot Water Pipe Sizing

From an article by J. R. Kell in the June 1948 HPAC.

Table 1.
Properties of Water at High Temperatures

Pressure, Psig	Temperature, F	Specific Heat Btu/F	Density, Lb/Cu Ft	Specific Volume, Cu Ft/Lb	Lb per US Gal	Viscosity, Centipoises
—	50	1.001	62.41	0.01603	8.32	1.307
—	100	0.9970	62.03	0.01613	8.29	
—	150	0.999	61.20	0.01634	8.19	0.432
—	200	1.0039	60.08	0.01663	8.03	
0	212	1.006	59.77	0.01671	7.98	0.284
2.5	220	1.007	59.62	0.01677	7.96	
5	227	1.008	59.45	0.01682	7.94	
6	230	1.009	59.37	0.01684	7.92	
10	239	1.012	59.10	0.01692	7.89	
12.6	245	1.014	58.91	0.01697	7.86	
15	250	1.015	58.79	0.01700	7.84	0.195
17.8	255	1.017	58.69	0.01704	7.83	
20	259	1.018	58.56	0.01708	7.82	
23.8	265	1.019	58.42	0.01712	7.80	
25	267	1.020	58.35	0.01714	7.79	0.163
27.1	270	1.021	58.22	0.01717	7.77	
30	274	1.022	58.11	0.01721	7.76	
34.5	280	1.023	57.94	0.01726	7.73	
35	281	1.023	57.91	0.01726	7.73	
38.5	285	1.024	57.77	0.01731	7.72	0.145
40	287	1.025	57.69	0.01733	7.70	
42.8	290	1.026	57.59	0.01736	7.69	
45	292	1.026	57.54	0.01738	7.68	
47.4	295	1.027	57.44	0.01741	7.67	
50	298	1.028	57.32	0.01744	7.64	
52.3	300	1.029	57.2	0.0175	7.66	0.13
55	303	1.030	57.1	0.0175	7.66	
60	308	1.031	56.9	0.0176	7.57	
65	312	1.032	56.8	0.0176	7.57	
70	316	1.033	56.7	0.0176	7.57	
75	320	1.035	56.5	0.0177	7.48	0.115
80	324	1.036	56.4	0.0177	7.48	
90	331	1.038	56.3	0.0178	7.48	
100	338	1.041	56.1	0.0178	7.48	
110	344	1.043	55.8	0.0179	7.41	
120	350	1.045	55.6	0.0180	7.41	0.08
140	361	1.050	55.2	0.0181	7.32	
160	371	1.054	54.9	0.0182	7.32	
180	380	1.060	54.4	0.0184	7.24	
200	388	1.066	54.1	0.0185	7.24	

Table 3—Heat Emission Coefficients for Bare Piping in Btu per Sq Ft per Hr per 1 F Difference Water to Air

Temperature Difference, F	Nominal Pipe Bore, In.						
	½	1	2	4	6	8	12
100	2.54	2.38	2.22	2.06	1.98	1.93	1.86
125	2.69	2.53	2.36	2.20	2.15	2.05	1.97
150	2.86	2.70	2.51	2.33	2.247	2.18	2.10
175	3.02	2.83	2.65	2.47	2.37	2.31	2.23
200	3.15	2.97	2.78	2.63	2.50	2.435	2.35
225	3.34	3.12	2.93	2.73	2.63	2.57	2.48
250	3.47	3.28	3.07	2.87	2.77	2.70	2.60
275	3.62	3.42	3.21	3.01	2.91	2.83	2.74
300	3.78	3.59	3.36	3.16	3.05	2.99	2.89
350	4.12	3.90	3.67	3.45	3.39	3.27	3.17
400	4.45	4.24	4.00	3.78	3.66	3.59	3.49

Table 2—Percentage Corrections for Temperature When Using Pipe Sizing Data Based on about 150 F

Corrections given are positive except where stated negative, (−). Correction applies to pressure loss for a given rate of flow.

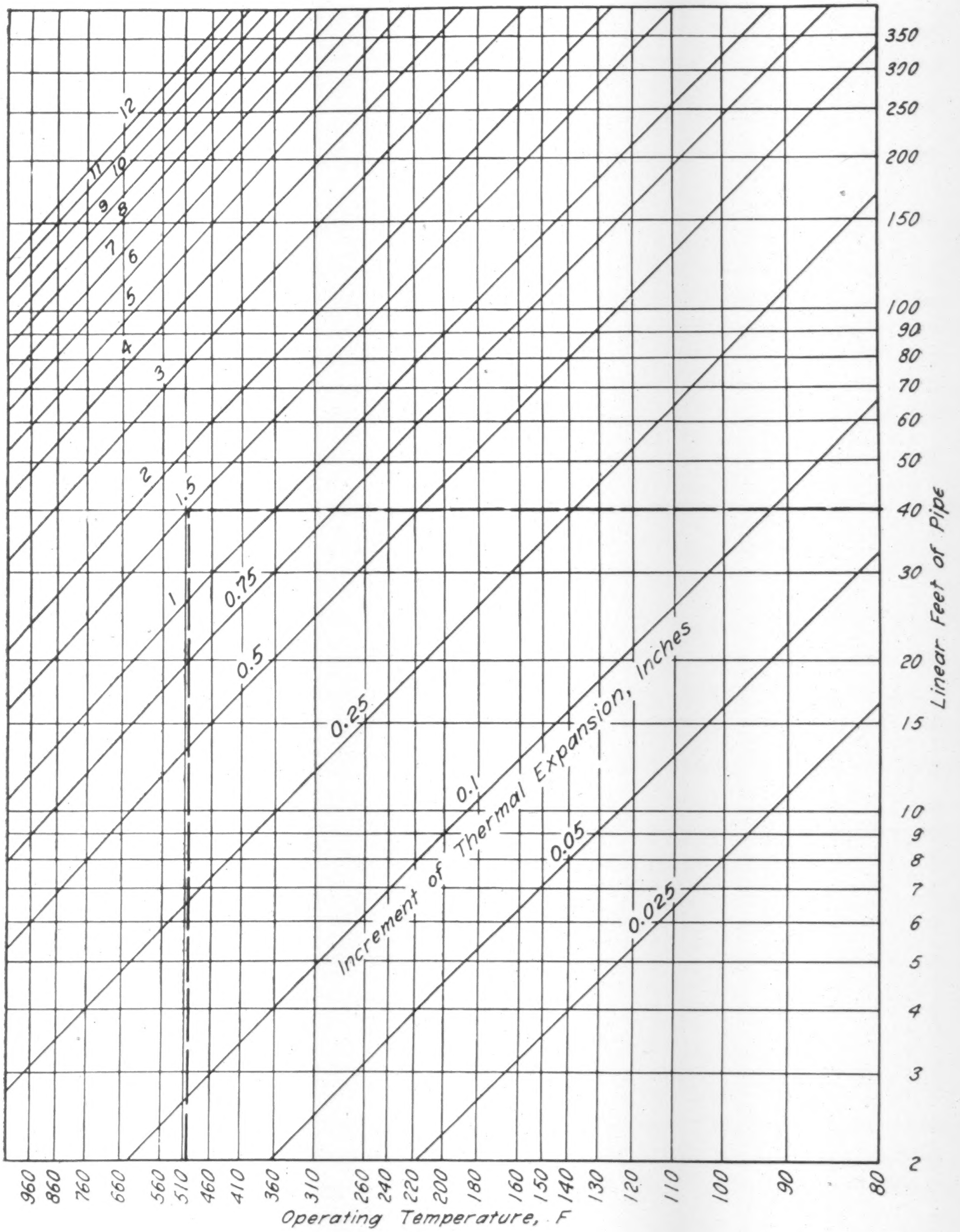
	Velocity at 150 F, Ft per Sec	Nominal Pipe Bore, In.						
		½	1	2	4	6	8	12
At 250 F	0.5	−26	−20	−13	−8	—	—	—
	1	−18	−12	−6	—	—	—	—
	2	−9	−6	—	—	—	3	3
	4	−4	—	—	3	3	4	4
	8	—	—	—	3	4	4	4
	12	—	—	3	4	4	4	4
At 350 F	0.5	−33	−24	−13	−3	—	—	7
	1	−21	−13	−4	—	5	6	7
	2	−10	−8	—	6	8	8	9
	4	—	—	6	8	9	10	10
	8	4	6	8	9	10	10	10
	12	6	7	9	10	10	10	10

Table 4—Transmission Coefficients for Radiant Heating Panels Using HPHW

Difference in Temperature Mean Water to Air	Face Downwards	Sloping, Degrees to Horizontal			Vertical
		10	20	30	
Actual Heat Emission, Btu per Sq Ft per Hr					
220	400	463	472	480	491
200	360	417	424	432	443
180	320	369	376	384	394
160	280	323	329	336	345
140	240	277	282	288	295
120	200	231	235	240	245
100	160	185	188	192	197
Heat Emission Including Comfort Effect					
Multistory Building — Room Above and Below Heated — Two Walls Exposed	Add 50% Up to Heights of 12'-0". Deduct 1% From Total For Each Foot of Additional Height	Add 30%	Add 15%	Add 3%	Deduct 3% For Height of 12'-0"
Multistory Building — Three or Four Walls Exposed, or Two Walls Exposed and Room Over Unheated or Top Floor With Two Walls Exposed	Add 38% Up to Heights of 12'-0". Deduct for Greater Heights As Above	Add 20%	Add 10%	Deduct 5%	Not Recommended
Single or Multistory Building — Three or Four Walls Exposed	Add 20% Up to Heights of 12'-0". Deduct for Greater Heights As Above	Add 10%	Nil	Not Recommended	Not Recommended

Determining Carbon Steel Piping Expansion

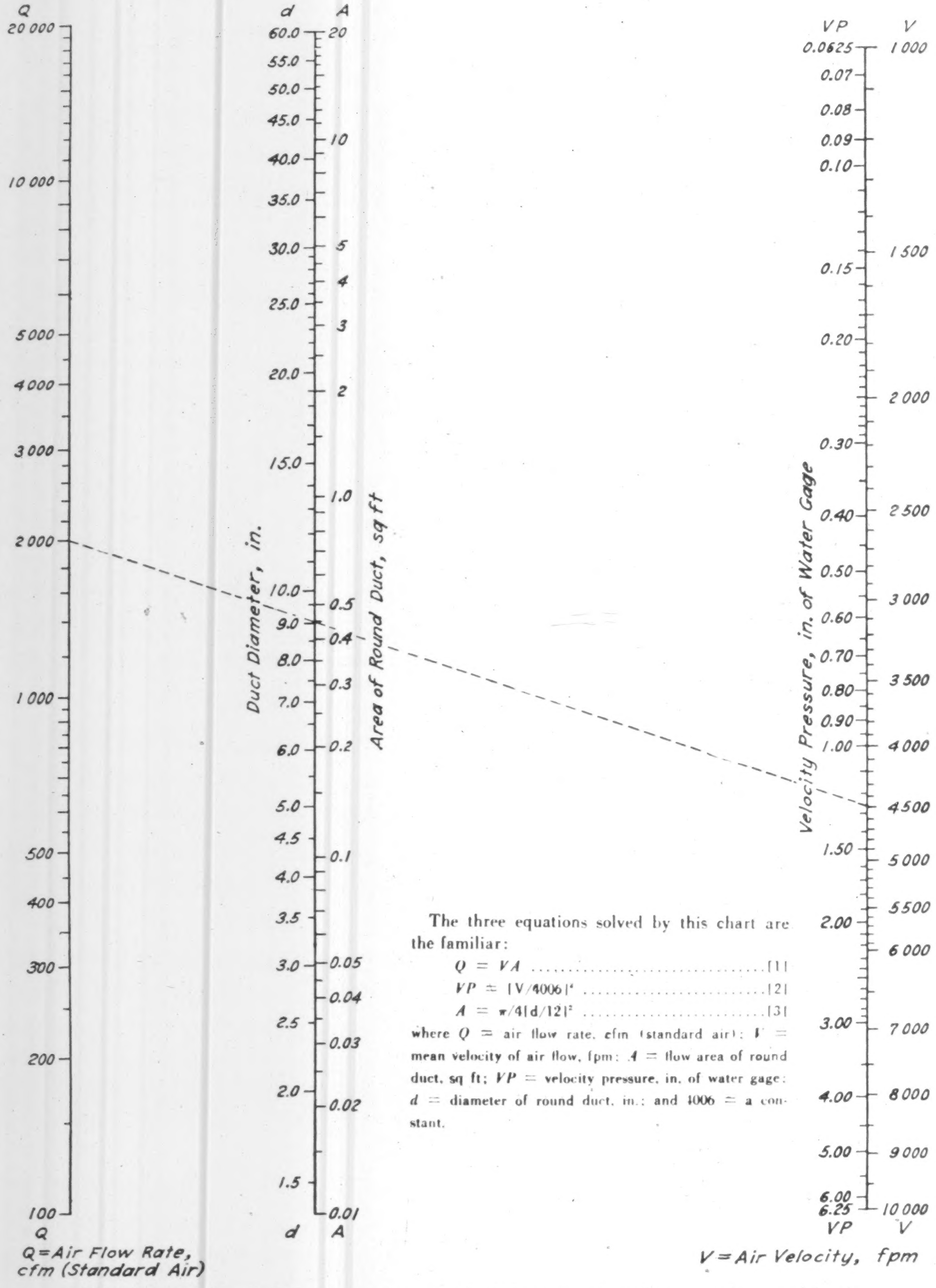
From an article by Robert J. Rubey in the March 1955 HPAC.



THERMAL EXPANSION of carbon steel piping in lengths from 2 ft to 400 ft at operating temperatures between 80 F and 1010 F may be read directly from this chart

Duct Design Nomograph

From an article by Robert W. Ruppert in the July 1955 HPAC.



The three equations solved by this chart are the familiar:

$$Q = VA \quad \text{.......} \quad [1]$$

$$VP \doteq (V/4006)^2 \quad \text{.......} \quad [2]$$

$$A = \pi/4(d/12)^2 \quad \text{.......} \quad [3]$$

where Q = air flow rate, cfm (standard air); V = mean velocity of air flow, fpm; A = flow area of round duct, sq ft; VP = velocity pressure, in. of water gage; d = diameter of round duct, in.; and 4006 ≐ a constant.

NOMOGRAPH (applicable only to air at standard density) solves three equations used in air flow determinations and simplifies the design of exhaust, ventilating, and dust collecting systems

Determining Pipe Support Spacing

From an article by T. E. Bridge, in the February 1950 HPAC.

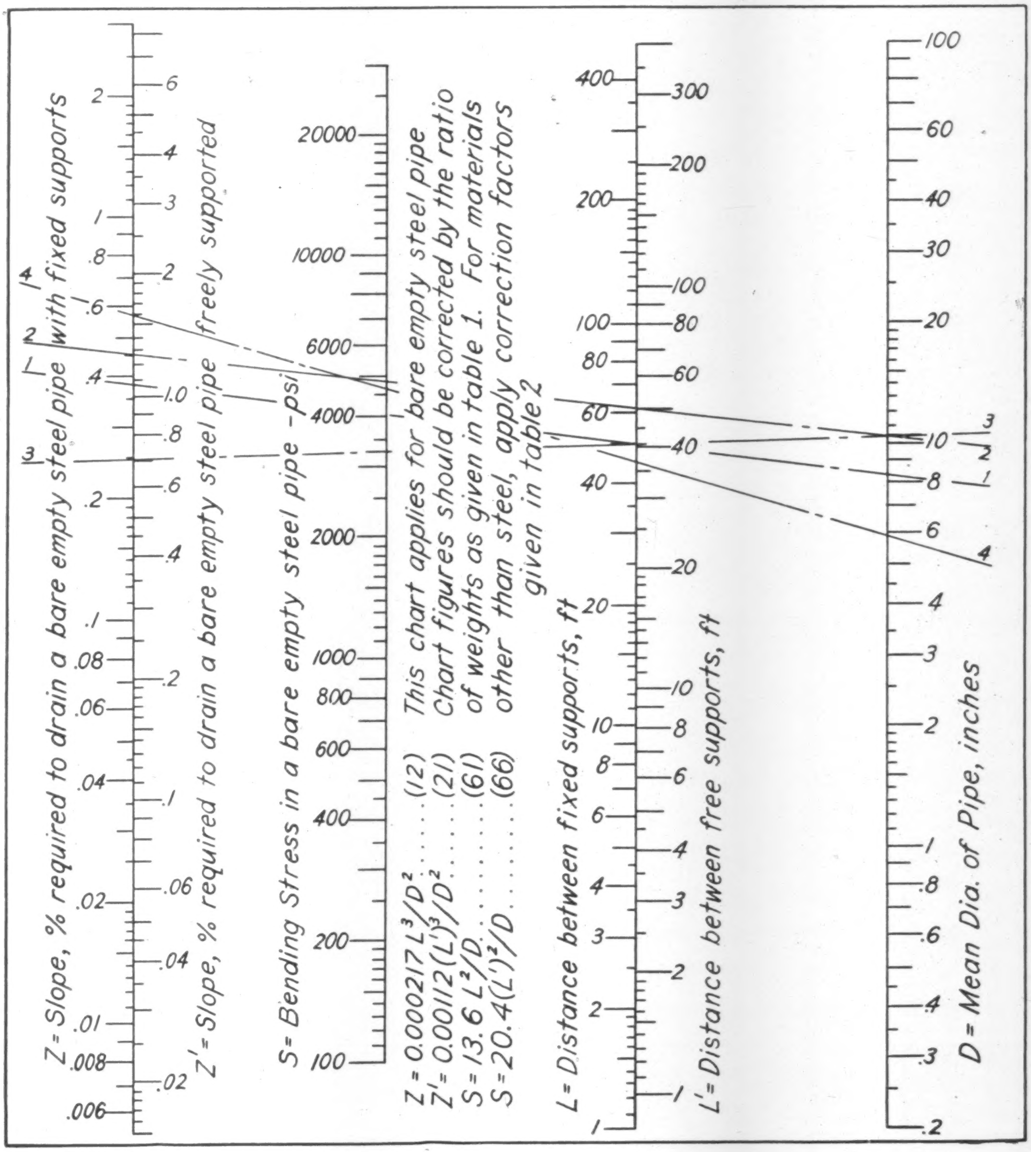


CHART USED to determine the maximum spacing of pipe supports. Weights per foot of pipe are given on following page, page 184

(*Continued from page* 183)

Table 1—Weights per foot of pipe in pounds

Diameter	1	1¼	1½	2	2½	3	4	6
Bare empty pipe								
Schedule 40	1.68	2.27	2.72	3.65	5.79	7.57	10.79	18.97
80	2.17	3.00	3.63	5.02	7.66	10.25	14.98	28.57
160	2.85	3.76	4.86	7.45	10.01	14.30	22.60	45.30
XX	3.66	5.21	6.41	9.03	13.69	18.58	27.54	53.16
Water in pipe								
Schedule 40	.374	.647	.882	1.45	2.07	3.20	5.51	12.51
80	.311	.555	.765	1.28	1.83	2.86	4.98	11.29
160	.226	.458	.608	.971	1.53	2.35	4.02	9.16
XX	.122	.273	.412	.769	1.07	1.80	3.38	8.14
Magnesia covering								
360 F Std. th.	.65	.80	.85	1.25	1.35	1.55	2.10	2.90
440 1½ in.	1.45	1.60	1.75	2.05	2.30	2.65	3.15	4.15
525 2 in.	2.25	2.45	2.65	3.15	3.40	3.95	4.75	6.40
800 (Combi-)	3.70	4.10	4.20	5.80	6.60	8.30	9.80	14.90
1000 (nation)	3.70	4.10	4.20	7.40	8.50	10.70	12.20	24.20
Diameter	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**
Bare empty pipe								
Schedule 10				37	42	47	53	63
20	22.4	28.0	33.4	46	52	59	79	95
30	24.7	34.2	43.8	55	63	82	105	141
40	28.5	40.5	53.6	63	83	105	123	171
60	35.7	54.7	73.2	85	108	133	167	240
80	43.4	64.4	88.6	107	137	171	209	297
120	60.7	89.2	125.5	147	193	239	297	416
160	74.7	116.0	161.0	190	241	304	374	536
Water in pipe								
Schedule 10				62	82	105	130	188
20	22.5	35.9	51.3	61	80	102	126	184
30	22.2	35.0	49.7	60	79	100	123	178
40	21.6	34.1	48.5	58	76	97	120	174
60	20.8	32.3	46.0	56	73	93	115	166
80	19.8	31.1	44.0	53	70	89	109	158
120	17.6	27.9	39.3	48	63	80	98	143
160	15.8	24.6	34.9	43	56	72	89	128
Magnesia covering								
260 F 1¼ in. th.	4.1	5.2						
360 1½ in. th.	5.3	6.6	9.6	10	12	13	14	17
440 2 in. th.	7.7	9.5	12.5	13	15	16	18	22
525 2½	10.3	12.3	15.5	17	19	21	23	27
600 3	12.5	14.2	18.8	20	23	25	27	32
800 (Combi-)	19.6	23.5	31.6	33	37	40	45	52
1000 (nation)	26.7	33.3	36.5	39	44	48	52	61

FACTORS with which to correct the values obtained from the alignment chart on page 183 for use with materials other than steel

	Correction factors Slope	Stress
Aluminum	0.97	0.35
Brass	2.45	1.07
Copper	2.06	1.14
Chemical lead	27.6	1.43
Cast iron	2.21	0.916
Steel	1.00	1.00
Stainless steel	1.00	1.00
Monel metal	1.25	1.125
Nickel	1.09	1.13

Sizing Piping for Steam Supply and Condensate Return

From two articles by R. G. Lubinsky and M. J. Williams of The Trane Co. in the November 1948 and February 1949 issues of HPAC.

Steam pipe capacity, lb per hr—5 psi steam
(Steam and condensate flowing in same direction)

Pipe size, in.	Pressure drop, psi per 100 ft of pipe length				
	⅛	¼	½	¾	1
1	24	31	44	54	62
1¼	52	68	97	120	140
1½	81	100	150	180	210
2	160	210	300	370	430
2½	270	350	500	610	710
3	490	650	920	1,130	1,300
3½	730	970	1,370	1,680	1,940
4	1,040	1,370	1,940	2,380	2,750
5	1,930	2,540	3,600	4,410	5,090
6	3,160	4,170	5,910	7,250	8,360
8	6,590	8,680	12,310	15,090	17,400
10	12,020	15,840	22,460	27,530	31,760
12	19,290	25,420	36,050	44,190	50,970

Steam pipe capacity, lb per hr—15 psi steam
(Steam and condensate flowing in same direction)

Pipe size, in.	Pressure drop, psi per 100 ft of pipe length					
	⅛	¼	½	¾	1	2
1	27	38	53	65	76	110
1¼	59	83	120	140	160	230
1½	91	130	180	220	260	360
2	180	260	370	450	520	740
2½	300	430	600	740	860	1,210
3	560	790	1,110	1,360	1,570	2,220
3½	830	1,180	1,660	2,040	2,350	3,320
4	1,180	1,660	2,350	2,880	3,330	4,700
5	2,180	3,080	4,350	5,330	6,160	8,700
6	3,580	5,060	7,150	8,750	10,120	14,290
8	7,450	10,530	14,880	18,220	21,060	29,740
10	13,600	19,220	27,150	33,250	38,430	54,270
12	21,830	30,840	43,570	53,370	61,690	87,100

Steam pipe capacity, lb per hr—25 psi steam
(Steam and condensate flowing in same direction)

Pipe size, in.	Pressure drop, psi per 100 ft of pipe length					
	⅛	¼	½	¾	1	2
¾	15	21	30	37	43	60
1	30	43	61	75	86	122
1¼	67	95	130	160	190	260
1½	100	140	210	250	290	410
2	210	300	420	510	590	840
2½	340	490	690	850	980	1,380
3	630	900	1.270	1,550	1,800	2,540
3½	950	1,340	1,900	2,320	2.690	3,790
4	1,340	1,900	2,680	3,280	3,800	5,360
5	2,480	3,510	4,970	6,080	7,040	9,920
6	4,070	5,770	8,160	9,980	11.550	16,290
8	8,480	12,010	16,980	20,780	24,050	33,910
10	15,480	21,910	30,990	37,920	43,890	61,880
12	24,850	35,170	49,740	60,860	70,440	99,310

Steam pipe capacity, lb per hr—50 psi steam
(Steam and condensate flowing in same direction)

Pipe size, in.	Pressure drop, psi per 100 ft of pipe length					
	¼	½	¾	1	2	5
¾	27	38	47	54	76	120
1	54	77	94	110	150	240
1¼	120	170	210	240	340	530
1½	180	260	320	370	520	830
2	370	530	650	750	1,060	1,680
2½	620	870	1,070	1,240	1,750	2,760
3	1,130	1,600	1,960	2,270	3,200	5,060
3½	1,690	2,390	2,930	3,390	4,780	7,560
4	2,390	3,380	4,150	4,790	6,760	10,690
5	4,420	6,250	7,670	8,860	12,500	19,780
6	7,260	10,260	12,590	14,540	20,520	32,470
8	15,120	21,360	26,210	30,280	42,720	67,590
10	27,580	38,980	47,840	55,250	77,960	123,300
12	44,270	62,560	76,780	88,680	125,100	197,900

(Continued from page 184)

Steam pipe capacity, lb per hr—100 psi steam
(Steam and condensate flowing in same direction)

Pipe size, in.	Pressure drop, psi per 100 ft of pipe length				
	½	¾	1	2	5
¾	50	61	70	99	160
1	100	120	140	200	320
1¼	220	270	310	440	690
1½	340	420	480	680	1,080
2	690	850	980	1,390	2,190
2½	1,140	1,400	1,620	2,280	3,610
3	2,090	2,560	2,960	4,180	6,610
3½	3,120	3,830	4,420	6,250	9,870
4	4,420	5,420	6,260	8,840	13,960
5	8,170	10,020	11,580	16,350	25,840
6	13,420	16,450	19,020	26,840	42,410
8	27,930	34,250	39,580	55,870	88,280
10	50,970	62,500	72,230	101,900	161,100
12	81,810	100,300	115,900	163,600	258,500

Steam pipe capacity, lb per hr—150 psi steam
(Steam and condensate flowing in same direction)

Pipe size, in.	Pressure drop, psi per 100 ft of pipe length				
	½	¾	1	2	5
¾	59	73	84	120	190
1	120	150	170	240	370
1¼	260	320	370	520	830
1½	400	500	570	810	1,280
2	820	1,010	1,170	1,650	2,610
2½	1,360	1,660	1,920	2,720	4,300
3	2,480	3,050	3,520	5,090	7,870
3½	3,710	4,550	5,260	7,430	11,760
4	5,250	6,440	7,440	10,510	16,630
5	9,720	11,920	13,770	19,450	30,780
6	15,950	19,560	22,600	31,930	50,520
8	33,210	40,720	47,050	66,470	105,100
10	60,590	74,310	85,860	121,300	191,900
12	97,250	119,260	137,800	194,700	308,000

Steam pipe capacity, lb per hr—200 psi steam
(Steam and condensate flowing in same direction)

Pipe size, in.	Pressure drop, psi per 100 ft of pipe length				
	½	¾	1	2	5
¾	67	82	95	130	210
1	130	160	190	270	430
1¼	300	360	420	600	940
1½	460	570	650	920	1,460
2	940	1,150	1,330	1,870	2,970
2½	1,550	1,890	2,190	3,080	4,880
3	2,830	3,470	4,000	5,650	8,950
3½	4,230	5,180	5,980	8,430	13,360
4	5,980	7,320	8,460	11,930	18,900
5	11,060	13,550	15,650	22,080	34,970
6	18,150	22,240	25,690	36,240	57,410
8	37,790	46,310	53,480	75,440	119,500
10	68,960	84,500	97,590	137,600	218,000

Steam pipe capacity, lb per hr—250 psi steam
(Steam and condensate flowing in same direction)

Pipe size, in.	Pressure drop, psi per 100 ft of pipe length				
	½	¾	1	2	5
¾	74	91	105	150	230
1	150	180	210	300	470
1¼	330	400	470	660	1,160
1½	510	620	720	1,020	1,620
2	1,040	1,270	1,470	2,070	3,280
2½	1,710	2,090	2,410	3,410	5,400
3	3,130	3,820	4,420	6,250	9,880
3½	4,670	5,710	6,610	9,340	14,770
4	6,600	8,080	9,340	13,210	20,890
5	12,220	14,950	17,290	24,440	38,650
6	20,060	24,540	28,380	40,100	63,400
8	41,750	51,100	59,100	83,500	132,000

Gravity, vacuum, and high pressure return pipe capacity, lb per hr

Pipe size, in.	Low pressure		High pressure return, steam pressure in psi					
	Gravity return	Vacuum return	25	50	100	150	200	250
¾			236	312	419	560	682	1,074
1	200	350	474	617	823	1,120	1,385	2,150
1¼	400	600	989	1,306	1,755	2,330	2,880	4,450
1½	700	950	1,610	2,126	2,850	3,800	4,710	7,350
2	1,200	2,000	3,280	4,325	5,785	7,700	9,550	14,875
2½	1,650	3,350	5,400	7,160	9,640	12,800	15,850	24,600
3	2,600	5,350	9,890	13,070	17,550	23,300	28,850	34,750
3½	3,860	8,000	14,700	19,400	25,900	34,500	42,700	51,350
4	6,500	11,000	20,800	27,360	36,550	49,200	60,900	73,350
5	10,400	19,400	38,850	52,925	70,000	91,500	114,500	127,600
6	18,000	31,000	61,200	83,700	112,700	150,000	185,500	223,100

Equivalent length of pipe to be added for fittings

Size of pipe, in.	Length in feet to be added to run				
	Standard elbow	Side outlet tee	Gate valve(*)	Globe valve(*)	Angle valve(*)
½	1.3	3	0.3	14	7
¾	1.8	4	0.4	18	10
1	2.2	5	0.5	23	12
1¼	3.0	6	0.6	29	15
1½	3.5	7	0.8	34	18
2	4.3	8	1.0	46	22
2½	5.0	11	1.1	54	27
3	6.5	13	1.4	66	34
3½	8.0	15	1.6	80	40
4	9.0	18	1.9	92	45
5	11.0	22	2.2	112	56
6	13.0	27	2.8	136	67
8	17.0	35	3.7	180	92
10	21.0	45	4.6	230	112
12	27.0	53	5.5	270	132

* Valve in full open position.

Table 1—Steam pipe capacity, lb per hr—50 psi steam
(Steam and condensate flowing in same direction)

Pipe size, in.	Pressure drop, psi per 100 ft of pipe length					
	¼	½	¾	1	2	5
¾	27	38	47	54	76	120
1	54	77	94	110	150	240
1¼	120	170	210	240	340	530
1½	180	260	320	370	520	830
2	370	530	650	750	1,060	1,680
2½	620	870	1,070	1,240	1,750	2,760
3	1,130	1,600	1,960	2,270	3,200	5,060
3½	1,690	2,390	2,930	3,390	4,780	7,560
4	2,390	3,380	4,150	4,790	6,760	10,690
5	4,420	6,250	7,670	8,860	12,500	19,780
6	7,260	10,260	12,590	14,540	20,520	32,470
8	15,120	21,360	26,210	30,280	42,720	67,590
10	27,580	38,980	47,840	55,250	77,960	123,300
12	44,270	62,560	76,780	88,680	125,100	197,900

Pressure drops used in determining capacities of return piping tabulated above

System	Pressure drop, psi per 100 ft of equivalent length
Vacuum	¼
25	½
50	⅝
100	¾
150	1
200	1¼
250	1½

(Continued on page 186)

(Continued from page 185)

Table 2—Equivalent length of pipe to be added for fittings

Size of pipe, in.	Standard elbow	Length in feet to be added to run Side outlet tee	Gate valve (*)	Globe valve (*)	Angle valve (*)
½	1.3	3	0.3	14	7
¾	1.8	4	0.4	18	10
1	2.2	5	0.5	23	12
1¼	3.0	6	0.6	29	15
1½	3.5	7	0.8	34	18
2	4.3	8	1.0	46	22
2½	5.0	11	1.1	54	27
3	6.5	13	1.4	66	34
3½	8.0	15	1.6	80	40
4	9.0	18	1.9	92	45
5	11.0	22	2.2	112	56
6	13.0	27	2.8	136	67
8	17.0	35	3.7	180	92
10	21.0	45	4.6	230	112
12	27.0	53	5.5	270	132

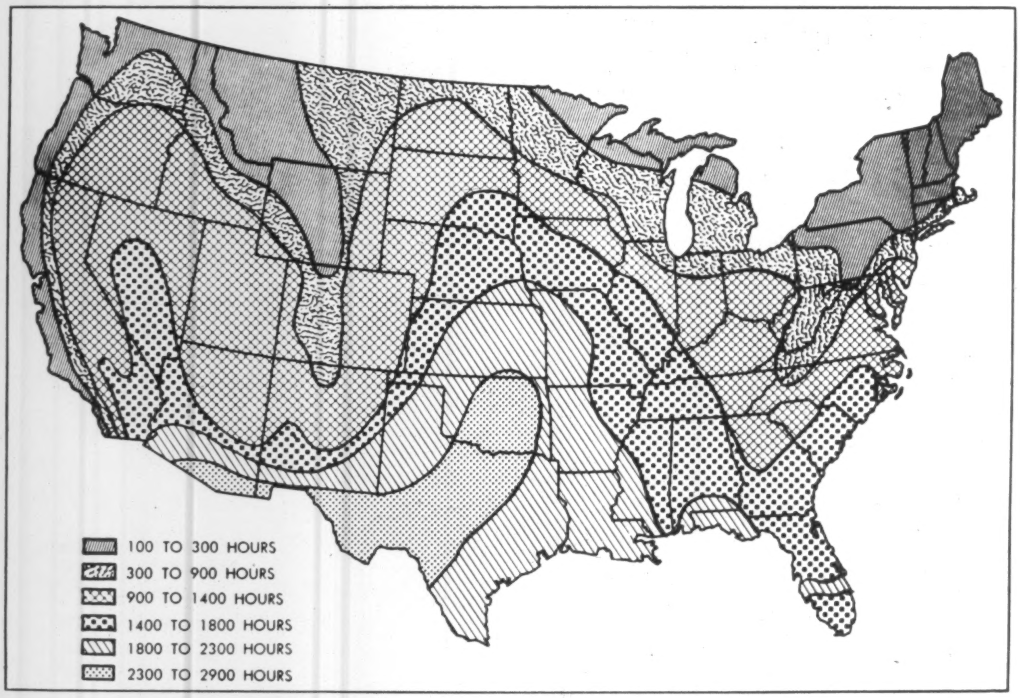
*Valve in full open position.

Table 3—Gravity, vacuum, and high pressure return pipe capacity, lb per hr

Pipe size, in.	Low pressure Gravity return	Vacuum return	High pressure return, steam pressure in psi 25	50	100	150	200	250
¾			236	312	419	560	682	1,074
1	200	350	474	617	823	1,120	1,385	2,150
1¼	400	600	989	1,306	1,755	2,330	2,880	4,450
1½	700	950	1,610	2,126	2,850	3,800	4,710	7,350
2	1,200	2,000	3,280	4,325	5,785	7,700	9,550	14,875
2½	1,650	3,350	5,400	7,160	9,640	12,800	15,850	24,600
3	2,600	5,350	9,890	13,070	17,550	23,300	28,850	34,750
3½	3,800	8,000	14,700	19,400	25,900	34,500	42,700	51,350
4	6,500	11,000	20,800	27,360	36,550	49,200	60,900	73,350
5	10,400	19,400	38,850	52,925	70,000	91,500	114,500	127,600
6	18,000	31,000	61,200	83,700	112,700	150,000	185,500	223,100

Operating Hours for Air Conditioning

From an article in the July 1954 HPAC based upon information developed by the Frigidaire Div. of General Motors Corp.



THIS MAP is a suggested guide for determining the operating hours for air conditioning throughout the U.S. The map has been based upon the average number of hours that the outdoor dry bulb temperature exceeds 80 F each cooling season

Tear out along this line

HPAC DATA SHEET

Nomogram Helps Find Outlet Area For Downward Jet of Heated Air

. . . for given jet length, temperature differential, and cfm

BY W. W. KENNEDY
Manager, Air Distribution Development
Barber-Colman Co.

and

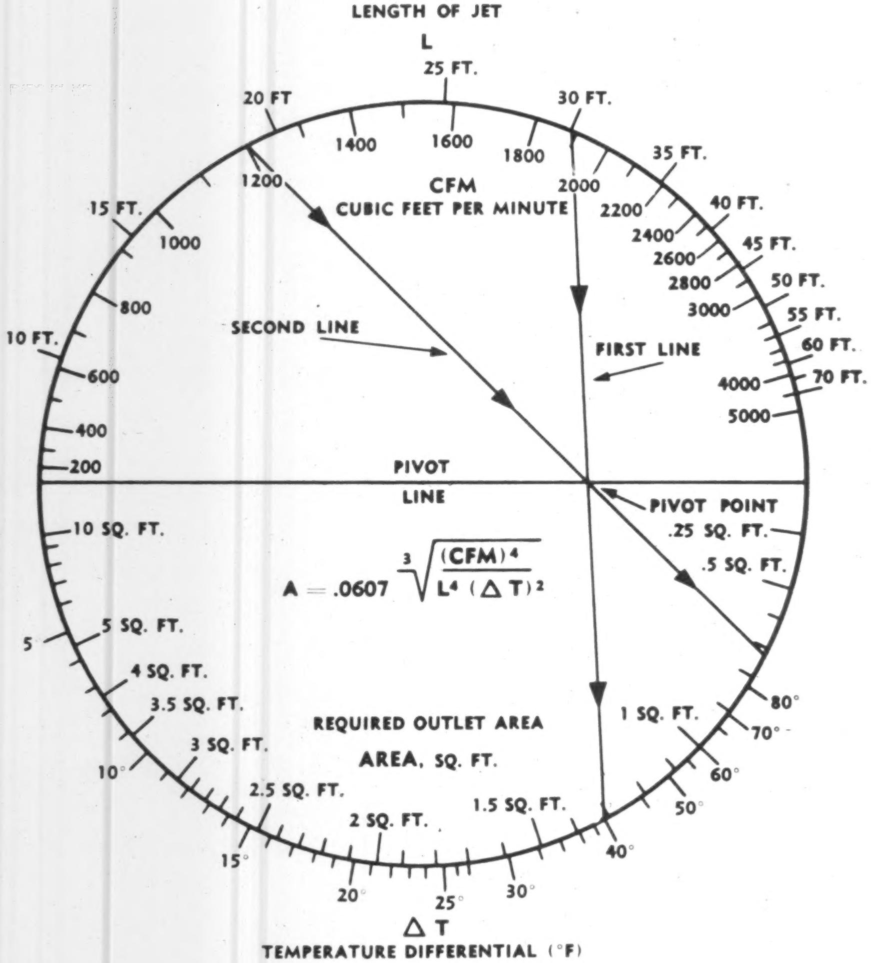
E. C. VARNUM
Head, Operations Research
Barber-Colman Co.

THE NOMOGRAM is a simple method of readily determining the supply outlet or round opening size necessary to project heated air of a given temperature to the floor. The equation used for the nomogram is a modified form of an equation developed by Professor Linn Helander and his associates at Kansas State college, for free jets for long radius nozzles — of the American Society of Mechanical Engineers standard — with downthrow in excess of eight orifice diameters. See Equation No. 1, p. 152, in the article, *Characteristics of Downward Jets from a Vertical Discharge Unit Heater*, by S. M. Yen, Linn Helander, and L. B. Knee, in the ASHAE Journal Section, November 1955 HPAC.

Drawing a line on the nomogram from the point representing the vertical throw, through the point representing the temperature differential and then another line from the point representing the cfm, through the pivot point, results in the area of the supply outlet or opening necessary. Dividing the cfm by the net area gives the velocity in fpm.

The nomogram is based on the use of round openings but is sufficiently accurate for use with square and rectangular openings having an aspect ratio no greater than four. It is not recommended for use with long slots.

With this information, an outlet size can be selected. Supply outlets used for downward projection of heated air should have a straight air throw.



REQUIRED OUTLET AREA is read from inner lower semicircle after finding pivot point of lines drawn from scales showing given values. For example, length of jet, L, = 30 ft; temperature differential, ΔT = 40 F; volume = 1200 cfm; area = 0.72 sq ft. Join length of jet value to temperature differential value, using outer scales. Draw line from cfm scale to intersection of first line with pivot line. Read required outlet area from inner lower semicircle

The object of the Society is to advance the arts and sciences of heating, ventilating, cooling and air conditioning, and the allied arts and sciences, for the benefit of the general public, to encourage and conduct scientific research, and to coöperate with other organizations having the same or similar objectives.

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Heating, Piping & Air Conditioning

Journal Section

of the

AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS

RESEARCH PROGRAM

Two features concerning the Society Research Program are included in the JOURNAL SECTION in this issue. Beginning on page 199 is the Annual Report of the Committee on Research, which will bring you up to date in what was accomplished during 1956. Then on page 207 there is outlined the projected program for 1957.

HONORS AND AWARDS

This is the season for Society honors and awards. At the October meeting of Council 5 members were elected to the new grade of Fellow. In November the first Gustus L. Larson Award of the Wisconsin Chapter was made (page 215). Council has also designated Prof. M. K. Fahnestock as the 15th recipient of the F. Paul Anderson Award. The matter of honorary membership for Dr. A. C. Willard is to come before the Annual Meeting (page 211). Honorary Member Herbert Hoover was presented with his certificate of membership (page 211). The first award of the ASHAE-Homer Addams Award has also been announced (page 211) and the presentation is scheduled to take place at the 63rd Annual Meeting (Program starts on page 208).

SOCIETY COMMITTEE ORGANIZATION

General Committees: The Society By-Laws provide for nine such committees. A list with the names of their members is included in this issue on pages 218-19

Research Committees: The research program is under the guidance of the Committee on Research — a General Committee. The Committee on Research appoints Technical Advisory Committees as needed. A list, with current membership, can be found in this issue of the JOURNAL on pages 218-19

Special Committees: At present there are nine of these committees. A list of them and of their personnel is included in this issue of the JOURNAL on page 219

Nominating Committee: This committee's membership is fixed by the By-Laws. Present membership can be found in this issue of the JOURNAL on page 219

SOCIETY REGIONAL ORGANIZATION

Names of the Regional Directors and a list of members of the Chapters Regional Committee can be found in this issue of the JOURNAL on pages 218-19

SOCIETY CHAPTERS AND BRANCHES

The Society has chartered 65 Chapters, 6 Student Branches and 1 Special Branch. These groups elect their officers and governing boards. A list appears in this issue of the JOURNAL on page 220

The President's Page

Membership Development

ALTHOUGH the progress and achievements of a professional engineering society should not be measured by the size of its membership, it is important for the vitality of any dynamic organization that the opportunities for service and affiliation be brought to the attention of qualified individuals. The strength of an organization such as ours is dependent on the influx of engineers from all segments of our profession who have the zeal to advance the arts and sciences of heating, ventilating and air conditioning for the benefit of all mankind.

In past years there has been no concerted effort on the part of Council to sponsor the development of new chapters. Neither has there been any special effort expended to increase the size of the membership, but despite this attitude the Society has been gradually expanding. Some of this growth may be attributed to the natural expansion of the industry, but in all probability a considerable part of the overall membership increase must be credited to the chartering of new chapters.

Based on recent experiences, the development of a new chapter has resulted from the spontaneous enthusiasm of a group of local members who felt that the services of the Society could be utilized to unite individual effort into group action. At the Chapters Regional Committee meetings held in the spring, certain areas of our country were found lacking in Society membership. It is in these areas of our country that attention is now being focused for the planned development of new chapters, as it is felt the aims of the Society can be utilized for the benefit of local interests.

In the comprehensive report which the Membership Committee submitted to Council on October 21, a careful analysis was made of ASHAE membership concentration by chapters. The purpose of this study was to determine the degree of saturation using a base of members per 100,000 population, and the results showed a range from 3.0 to 52.5. As would be expected, the lower concentrations of membership are found in the larger cities and the larger ratios are observed in cities around 100,000 population. While the study may not indicate why this situation exists, it does indicate that there are tremendous potentials for membership growth in the larger cities as compared with the smaller communities. A copy of this Membership Development report will soon be made available to each current officer in every chapter and it certainly warrants careful study and review.

By the time this message is printed, the entire Society membership will have been asked to give thought to suggesting worthwhile candidates for admission into the Society. Here is your personal opportunity to be of service to an engineer who should be proposed for Society membership.

Several years ago our Society fostered an active program of endeavoring to establish Student Chapters at the various engineering colleges. Partly because of the fact that many of these schools discontinued options in heating and air conditioning, and because the competition for a student's time was so great, we have recently taken an inactive interest in this field. However, there are signs of the time which would indicate that our Society would be of service to our industry and the profession if it took a revitalized interest in the sponsorship of Student Chapters. With the keen competition for engineering talent it is possible that through such student groups the opportunities in our field can be presented, and of equal importance, many of these younger members would be eligible for active participation in local chapter and national Society activities.

Whatever your interest in ASHAE may be, membership development warrants some of your personal attention and active support.

John W. James

President
AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS

From '36 to '56—Air Conditioning Comes of Age

By Walter A. Grant*, Syracuse, N. Y.

This paper, since it is historical in character, is being presented in the JOURNAL SECTION in 3 parts. In this part the author mentions various developments which have taken place during the last 20 years on the basis of the Pre-War period, the World War II period, and the Post-War period. He also summarizes important advances in basic knowledge between 1936 and 1956. Included also is a statement of what has taken place in connection with air-conditioning equipment during the past 2 decades.

DURING the first 35 years of this century, the air conditioning industry rose meteorically from a handful of ideas and a pocketful of capital to a place of prominence on the American business scene. It was an era of pioneering innovation, when much more was unknown than known, when imagination and insight produced leaping technical advances over the chasms in basic knowledge.

By contrast, the last 2 decades of air conditioning progress seem strangely quiet. This has been an era of improvement, of consolidation, and of acceptance. The industry has taken the brilliant technical and engineering advances prior to 1936, has translated them into eminently marketable products and systems, has produced and sold, and has installed and serviced them in volume. In 2 short decades it has achieved strength and maturity. Air conditioning has come of age.

One way to measure maturity and achievement is to review the hundreds of improvements, each minor in an individual sense, which have combined to produce the vastly superior products available today. The consumer is breathing cleaner air. His indoor environment is almost completely free of drafts. The air conditioning machinery is quieter, more foolproof, more durable, and costs less to maintain. For example, the average refrigerant charge in open compressor systems lasted about 3 years. Now, in a tight hermetic system it lasts indefinitely. A uniform indoor climate is now a fact all 12 months of the year. And all of this has been accomplished at progressively lower costs to the consumer.

One sure gage of an industry's maturity is the degree and nature of its acceptance. The steady upward growth of air conditioning sales to all markets is an accurate measure of the degree of acceptance. There are many insights into the changing nature of consumer acceptance. Only 20 years ago, air conditioning was a novelty. It was a heady adventure, a traumatic treat, to shiver in an air conditioned theater. The marquee outside publicized this fact with large hanging silver icicles. And it was invariably too cold and too damp inside.

Since then, people have learned to live with air conditioning. It has become an accepted fact of life. It is no longer necessary to freeze the consumer to prove concern about his welfare. People no longer operate either their heating or cooling equipment at 68 F. The spartan complex, both summer and winter, has given way to the temperature which the user prefers, instead of the temperature someone thinks he ought to enjoy. Gone is long underwear in winter and wilted collar and shirt in summer. Modern men and women wear clothing of about the same style and weight all year round.

The point is that the consuming public no longer thinks of air conditioning as providing an occasional cool thrill on a scorching day. It is now taken for granted, has become an integral part of everyday living. Air conditioning has come of age.

1936-40—The Pre-War Period

In 1936 the country was struggling to climb out of the trough of the great depression. Economic conditions throughout the thirties precluded any dramatic break-through in new markets although research continued under severe financial handicaps. During this period residential construction began to fall behind actual needs, to be stopped entirely during the war, and thus create the tremendous pent-up demand of the latter forties. Large office building construction had ceased. Building managements were more anxious to fill their echoing rooms with tenants than with conditioned air. Keen competition stimulated fitful activity in shops and other retail establishments, less than 5 percent of which had been air conditioned by 1936. Theaters which had pioneered comfort cooling through the twenties had reached about 15 percent saturation. And only about 1 percent of total factory floor space was air conditioned, concentrated in those industries where control of the environment was essential to production. Less than 1 percent of Class A office space was conditioned. There was no residential cooling business.

In view of its economic background, it is remarkable that the air conditioning industry itself was not smothered in its infancy. When it is considered that the industry had not yet developed a sound distribution network for its products and systems; that its financial condition left much to be desired; and that neither of its 2 major markets — residential and commercial buildings — had yet awakened, one is forced to conclude that the industry held forth an economic need that would not be denied. Clearly distribution, sales promotion, and consumer acceptance would have to be stepped up to permit volume production to keep pace with the industry's record of technical progress.

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*Vice President, Research and Development Division, Carrier Corporation. Member of ASHAE.

For presentation at the 63rd Annual Meeting of the AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS, Chicago, February 1957.

Journal Section

Distribution in the early days was entirely through the contracting of specially engineered and tailored installations. In many of the larger cities, there were capable consulting engineers who were able to design plants for commercial customers, for bid and installation by mechanical contractors. But in large areas of the country, and for industrial applications generally, the client still looked to the experienced air conditioning contractor to perform the engineering and installation services he required.

Yet in this pre-war period the basic steps had been taken toward industrial strength through wider distribution. In the fall of 1932 the first dealer organization had been created by Carrier to be followed within a few years by other companies. Early dealerships were operated by a conglomeration of entrepreneurs — heating and ventilating contractors, commercial refrigeration fixture outlets, plumbing houses, electrical contractors, building supply jobbers, hardware stores — in fact anyone with a little capital and a large faith in air conditioning's future. The major contribution made by the early dealer was financial, since he knew little about designing, selling, installing, and servicing. The manufacturer continued to perform these functions for some time while he trained the dealer in all the specialized operations of the business. There was virtually no distributor-dealer relationship at this time, since volume distribution had not begun. Because practically all installations had to be engineered into the customer's building, sales people of the period were preponderantly engineers. In 1936 the dealer segment of the industry was still wrestling with air conditioning's technical complexities, but it learned fast, and by 1940 dealers were handling around 30 percent of the business.

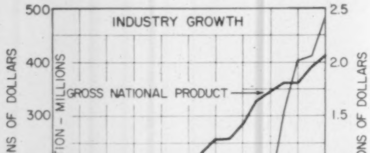
Amid all of these problems of distribution, important product advances were achieved. The first self-contained units for the commercial market appeared, and room air conditioners began their bid for public favor. Highly significant improvements were made in refrigerating compressors and heat exchangers, stimulated by the new fluorinated refrigerants. The future looked bright, and more and more companies started to enter the air conditioning business through formation, merger, or acquisition.

1941-45—World War II

In the early war days, business leaders believed that wartime needs for the industry's products would be so minor that wholesale conversion to direct military production would be required. This did not prove to be the case. About 80 percent of the industry's manufactured output consisted of normal civilian or special military designs of air conditioning products and systems. But they were entirely for military or essential civilian end use. The industry operated under many handicaps, and material shortages became a severe problem. Successive scarcity of nickel, chrome and copper led to substitutions of steel and plastics in many products and components, and taxed the ingenuity of design and application engineers.

Process air conditioning was used in numerous war-related industries — for precision machining, and instrument and communications equipment manufacturing, to hold tolerances and protect against corrosion and grit; for pharmaceuticals, to provide uniformity, control chemical reactions, and inhibit bacteria; for bombsights, telescopes, and other optical equipment, to control dust and dimensions; for powder and explosives, to retard deterioration and assure accurate timing; and so on, through electronic tubes, textile fibers, plastics, and the processing, storage and transportation of food.

Beyond essential industrial uses were the direct military requirements. For the Air Force were control towers, celestial navigation and Link trainer rooms, storage and maintenance of bombsights, parachutes and flight clothing, engine test buildings, and photographic trailers. For the Army were hospitals, commissaries, rooms for instrument and equipment repair and adjustment, and mobile units of many types. For the Navy, air conditioning went to sea in submarines, battleships, cruisers, destroyers and aircraft carriers.



Air conditioning sales are at consumer level, installed. Excluded are domestic and commercial refrigeration equipment, heating, and cooling towers. Statistics in Figs. 1-5 represent best available judgment applied to data from U. S. Department of Commerce, *ACRMA*, *ARI*, and other reliable sources, with estimates made for years lacking adequate data.

Fig. 1 — Growth of air conditioning sales in the last 20 years in relation to the growth of population and the overall economy

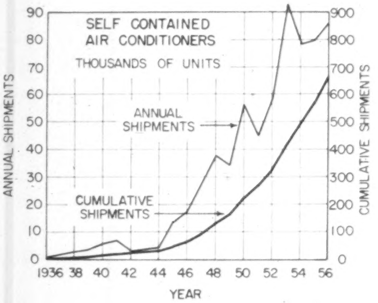


Fig. 2 — Number of self-contained air conditioners shipped in the period 1936 to 1956. Note the sharp transition at the end of World War II from the pioneering to the acceptance stage of the business

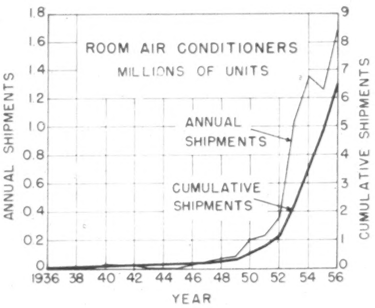


Fig. 3 — Number of room air conditioners shipped in the last 20 years. Note that in the last 4 years, more than 5 times as many units were shipped as in the entire 16 years previous

Possibly 20 percent of the industry's manufacturing facilities were devoted to direct war work unrelated to air conditioning. Tank gun mounts, magnetic brakes, searchlight parts, anti-submarine devices, airframe components, and shell loading formed but a small part of this activity. Air conditioning manufacturers conducted service and maintenance schools for the armed forces and performed a substantial amount of research and development work for the government, much of it at the manufacturers' expense. Representatives of the industry served on the Industry Advisory Committee to the War Production Board and in many other important capacities in government service.

These were years of peak output during which major research energy was expended on special applications. Advances in products and techniques were directly related to the major problem at hand — winning the war. Air cycle cooling was developed for aircraft, and dehumidifying equipment now used in damp basements was designed for subterranean bomb shelters. The massive low temperature air conditioning plant for the Cleveland N. A. C. A. wind tunnel and York's all-weather stratosphere chamber for personnel testing are merely 2 of many outstanding applications. While new civilian comfort air conditioning was non-existent, the experience of thousands of service and civilian personnel with air conditioned structures like the Pentagon in Washington and blackout plants throughout the land awakened a desire for air conditioning and set the stage for the market expansion which was to follow.

The war proved 2 points: that air conditioning was essential to the war effort; and that the men and women of the industry had accomplished miracles in supporting the military program. The country began to realize, indeed, that air conditioning was coming of age.

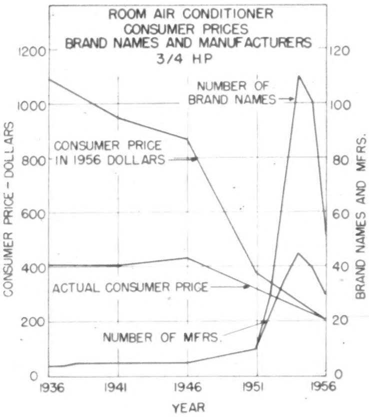


Fig. 4 — Number of room air conditioner brand names and manufacturers reached an all-time high in 1954. Due to sales volume and product improvement in a free competitive economy, consumer prices fell dramatically from 1936 to 1956

1946-56—The Post-War Period

The industry emerged from the conflict with relatively few conversion problems and set about effecting its transition to maturity. Prior to the war, it had relied upon engineering and application skill to pull it through. Post-war, it exploited all of its resources. The merchandising and marketing arm of the business was greatly strengthened by the development of self-contained equipment. Advertising, largely restricted in the thirties to trade magazines, has since been employing and exploiting every available medium.

Fig. 1 illustrates in broad terms the success achieved in this post-war decade. While population between 1936 and 1956 increased by less than a third, and gross national product increased 5 times, the value of air conditioning sales at consumer prices soared 50-fold from over $48,000,000 to $2,400,000,000. And most of this increase has occurred since 1946. This curve and the post-war sales curves for typical air conditioning products (Figs. 2, 3 and 5) bear a striking similarity, with first a gradual rise, and then a breakaway, illustrating a typical growth pattern. During the thirties air conditioning was completing its apprenticeship to the industrial roster, a period of great innovation and trial. Since the war the era of public acceptance has dawned, and the entry of many new companies (Fig. 4) showed that this period was here to stay.

But Figs. 3 and 4 illustrating the room air conditioner picture demonstrate far more. In 1936 only about 3,000 units were sold compared with 1,700,000 in 1956. During that interval the retail price has been cut in half from $400 to around $200. But the 1936 price expressed in 1956 dollars is $1,100 which is 5-½ times the price it can be purchased for today. Since the war, the manufacturing industry has made an enormous investment in new plant and production tools. Here truly is an example of the American competitive system at work to bring better products and values to the consumer.

Yet the principal air conditioning markets are still far from saturated. In 1936, there were only 2 markets where more than 1 percent of the establishments were cooled. This picture has changed tremendously in the past 20 years. It is now estimated that about 90 percent of all theaters, 35 percent of motels, 27 percent of Class A commercial office buildings, 15 percent of hotel guest rooms and retail stores, and 3 percent of the churches in this country are air conditioned.

But the lush markets of the future are still practically untouched. Considering all types of dwelling units — single and multi-family houses, apartments, mobile homes — only about 6 percent have any form of cooling at all. Although annual shipments of central cooling units in 1956 were around 175,000 units (Fig. 5), the total installed to date

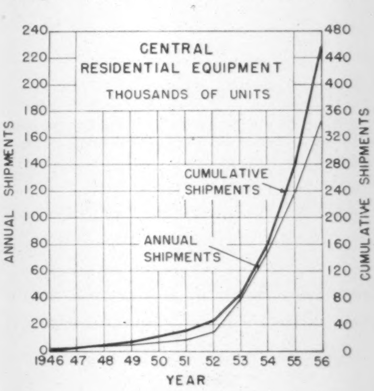


Fig. 5 — Central residential equipment was non-existent 10 years ago, is only now reaching its stride

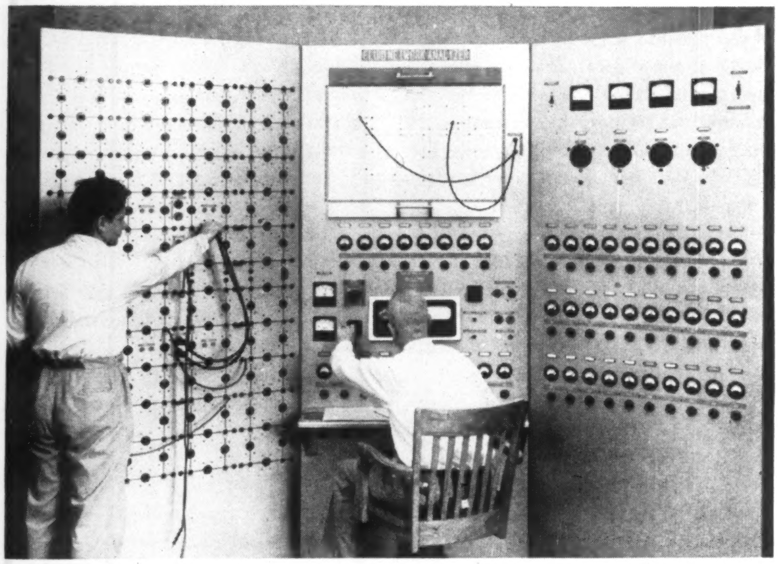


Fig. 7 — Typical electric analogue computer in operation. Computers similar to this are proving very useful in analyzing complex thermal circuit problems relating to heating and cooling loads in buildings

represents only between 1 and 2 percent of saturation. And the other great potential market, comfort cooling of factories, is perhaps 2 percent air conditioned today.

The post-war era has also seen the rise of markets barely touched in the thirties. Automobile air conditioning was not a factor until 1951 when about 2,000 units were installed. The 1956 estimate is 300,000 units, and sales for 1961 are projected at 2 million. Another new market is the 600,000 existing and 110,000 annual construction of house trailers, where air conditioning is proving just as attractive as in fixed residences.

The tremendous growth in the last 20 years would not have been possible without a solid foundation of scientific and engineering achievement. Let us review the record in detail.

Basic Knowledge

The foundation for all technological advance is expansion of basic knowledge. Such an expansion has occurred in large measure during the past 20 years. It is impossible in a paper of this scope to dwell upon the advances in all the areas of science which have influenced the growth of air conditioning. Of interest here is the progress in fundamental knowledge in those particular areas of physics, thermodynamics, heat transfer, fluid flow, and physiology which have had direct impact upon air conditioning.

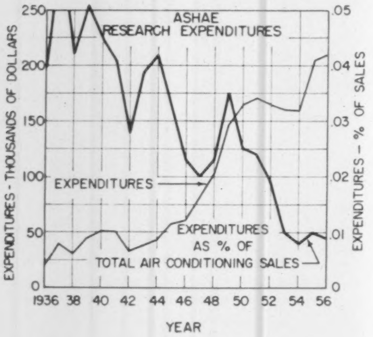


Fig. 6 — ASHAE expenditures for research during the last 20 years. Note the sharply decreasing rate when measured as percent of air conditioning sales charted in Fig. 1

To present a bibliography would require a volume in itself. Fortunately, the important references are listed in the current ASHAE Heating Ventilating Air Conditioning Guide, the ASHAE Transactions, the *ASRE* Data Books, and in Refrigeration Abstracts. The reader is referred to these sources for details about accomplishments and the people who have been responsible for them.

Our Society has conducted and sponsored much important basic research since establishment of its research program in 1919. Fig. 6 shows how this activity has grown since 1936.

In the very forefront has been research in the physiological and medical field. The effect of thermal shock has been studied and evaluated, and much has been learned about the influence of both extreme and optimum air conditions upon healthy people, on persons afflicted with organic disorders, and those suffering from respiratory infections and allergies. Gradually a better understanding of the sensation of comfort is being achieved, and of the effect of air conditioning on human productivity and efficiency. But much remains to be learned.

Basic work on odors is now being conducted both in this country and in England by chemists, physicists, physiologists, biologists, and psychologists, as well as by engineers. The Technical Advisory Committee on Odors assembled authorities in their respective fields at the Basic Odor Research Correlation Conference in New York City in 1953. Further fundamental studies at the ASHAE Laboratory resulted in a very important paper presented at the ASHAE annual meeting in 1955. As soon as the basic mechanism of odor perception is understood it will be possible to control odors in air-conditioned spaces.

In the field of thermodynamics, important additional data have been obtained on the properties of moist air, leading to improved psychrometric charts and tables. Results obtained during the past 10 years from investigations into the nature of vapor transmission through materials represent a real advance toward developing practical methods for preventing unwanted condensation. Absorption and adsorption phenomena have been further explored. More accurate values of film coefficients for gases, liquids, and boiling and con-

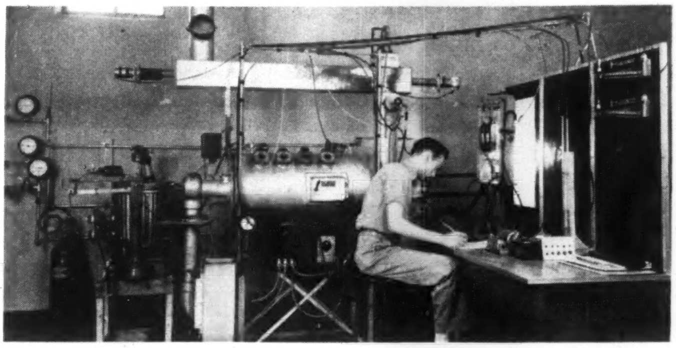


Fig. 8 — Research work in process at the ASHAE Laboratory in Cleveland. Pictured is a test unit to measure the burning characteristics of fuel oils

densing vapors have been obtained, as well as certain basic properties of materials, such as conductivity, specific heat, density, and viscosity. Some knowledge has been gained about the mechanism of frost formation.

Advances in heat transfer have been many and important. Periodic and transient heat flow analyses and experiments have led to more accurate evaluations of cooling loads in structures. An important step in facilitating analyses was the development of the sol-air temperature concept by Mackey, and an increasingly useful tool has been the application of analogue computers for solving heat flow problems. (Fig. 7).

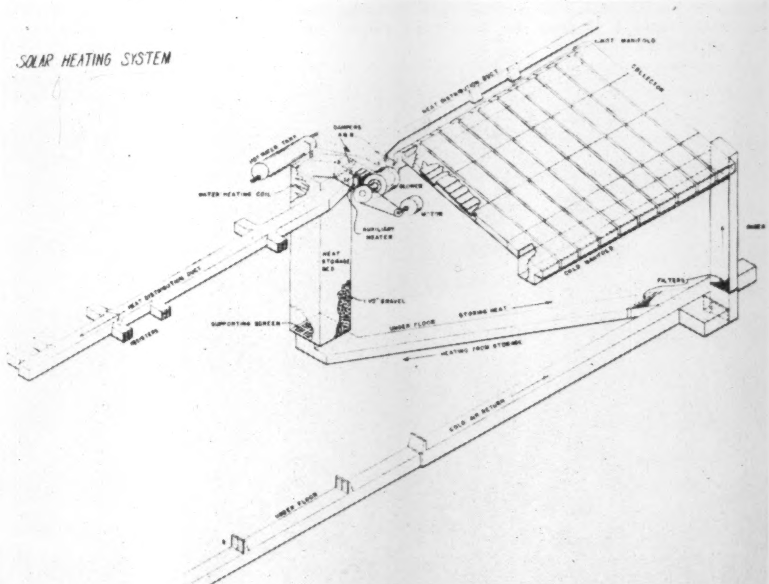
Recognition that the heat storage of building materials may be utilized to level out the calculated instantaneous cooling load has significantly reduced the size of equipment installed in residences and commercial buildings. A by-product of smaller capacities has been better control of humidity and improved comfort conditions. Of substantial importance to the application of air conditioning systems has been increased knowledge in control system theory and engineering. The thermal storage effect of the radiant portions of solar and lighting loads is better known. Research activity along this line has been accelerating, and a better understanding of how and when an impressed heat gain becomes equipment load is imminent.

Research into properties of glass and plastics, and their influence on solar heat gains, has prompted the development of heat absorbing glasses and improved shading devices. In the realm of heating an outstanding area of progress is the entire theory of panel heating, including data on the radiant and convective portions of the useful heat output under a variety of configurations and conditions. Important for the heat pump, has come an extensive examination of heat sources, including air, water, ground, and solar radiation.

In fluid dynamics, important additions have been made to fundamental knowledge of compressible flow, which have led to design improvements in turbo-machinery. Incompressible flow has also received attention: examples include the improved friction chart for air flow in straight pipe; more information about the mechanism of energy losses in duct fittings; and refinements in the static regain concept. Some advances have been made in the flow of air within conditioned spaces, involving the complex factors of induction, turbulence, mixing, heat transfer, buoyancy, and inertia, but much remains to be done. The surface of the problem has hardly been scratched.

The rapid strides made in atomic physics during the past 20 years in knowledge of the structure of matter are bound to affect air conditioning. Semi-conductors have been revolutionizing electronics and research work is in progress to use electricity directly to produce cooling through the Peltier effect. Research has accumulated more basic information on sound and vibration-generation, transmission, isolation, and absorption. With depletion of natural resources of fossil fuels, utilization of solar energy for heating or cooling has been receiving increased attention. Better data are available on its geographical availability, and im-

Fig. 9 — Solar heating system for the Denver Design House



provements have been made in collecting and concentrating devices.

Air Conditioning Equipment

In 1936, Willis H. Carrier in his paper[†], described in detail the spray type air conditioner first designed and built in 1903, and developed to a high efficiency in the years to follow. He also noted the first use of cooling coils, and the development of unitary air conditioners, both fan-coil and completely self-contained.

The double decade since his review has been marked by the almost complete swing to coil-type equipment, relegating the spray air conditioner to industrial applications where it still has a special advantage. The number of types and arrangements of fan-coil and self-contained units is beyond count, and is a consequence of the fantastically accelerating demand for products which will meet every conceivable application requirement.

In the late thirties, the self-contained summer air conditioner, which included all the elements of the refrigeration cycle, moved in 2 directions: (*a*) equipment for cooling small rooms and (*b*) equipment for cooling larger spaces. The former, optimistically called a portable room cooler at the time, has since been officially named the room air conditioner for sizes below 1-½ hp. The category above 2 hp, now called self-contained units, is subdivided into styled equipment for use within the space, and equipment for remote location employing fans suitable for ductwork.

Room Air Conditioners: Early room air conditioners which employed water-cooled condensers and required plumbing and drain connections did not lend themselves well to appliance selling. The air-cooled model was welcomed because of its easy application and suitability to mass production and market techniques. It is the first product the industry has developed which can be classed as a major household appliance. Much work has gone into perfecting it in the last 20 years. Noteworthy have been the high-speed hermetic direct-drive compressor; the capillary feed device; quieter fans; increased use of plastics; improved compressor and fan motors; and substitution of aluminum for copper in heat transfer components. These developments have brought much better space utilization. In 1936, the volume occupied by a ¾ hp unit was over 15 cu ft; by 1956 the average was down to about 7 cu ft. The same so-called portable unit weighed 465 lb in 1936; the comparable 1956 figure is 200 lb.

Early room air conditioners were all consoles. The first window sill model made its bow in the late thirties and by 1950 its lower price had practically squeezed the console out of the picture.

In the last 2 or 3 years, sales volume has been large enough to justify diversified model types to satisfy particular application requirements. Window units are showing a definite trend toward a thinner silhouette with minimum overhang indoors and out. They are also receiving increasing attention for through-the-wall application, signalling their acceptance for permanent instead of makeshift installations. Recent Underwriters' rulings have made advantageous the development of 7-½ and 12 ampere units to permit plug-in on conventional house wiring circuits. Consoles

Fig. 10 — This console room air conditioner (casing removed) of vintage 1933-37 was 20 years ahead of its time, featured a hermetic compressor and reverse cycle heating, and won for its inventor Henry L. Galson the John Scott medal awarded by the city of Philadelphia

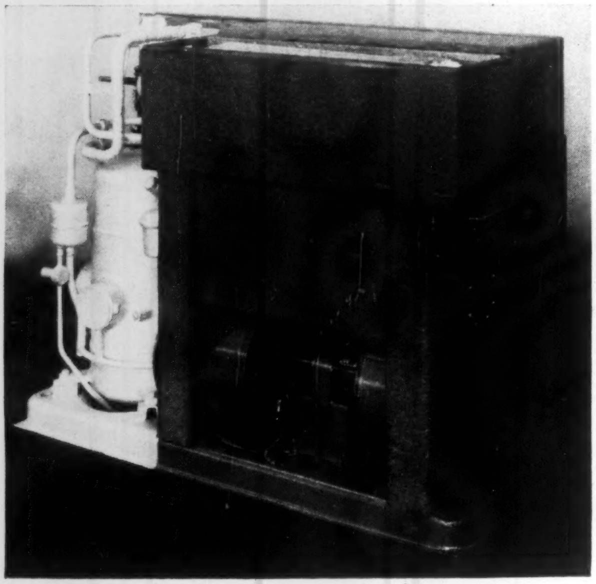
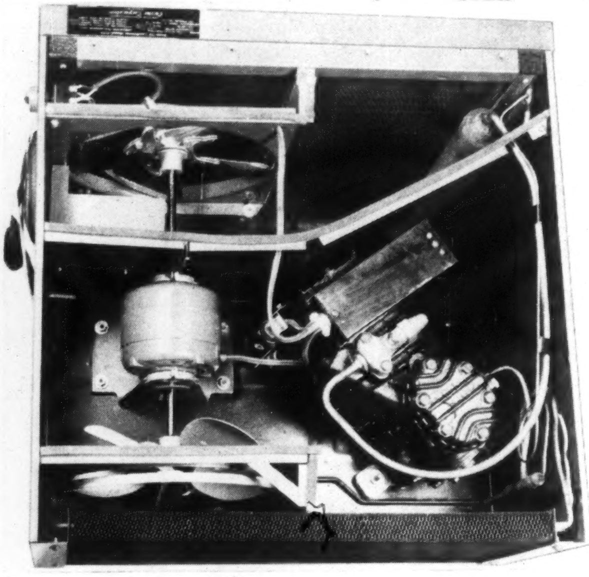


Fig. 11 — Top view of modern window model room air conditioner, showing evaporator fan and coil (top), condenser fan and coil (bottom), and hermetic compressor (right)



[†] Progress in Air Conditioning in the Last Quarter Century, by W. H. Carrier (ASHVE TRANSACTIONS, Vol. 42, 1936, p. 321).

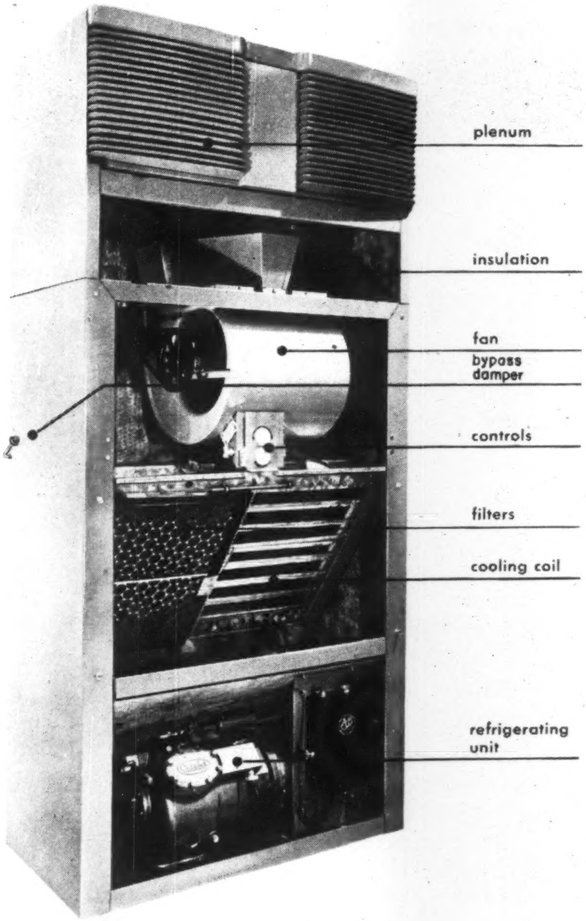


Fig. 12 — 1956 model 5-ton self-contained air conditioning unit for commercial establishments, showing principal functional elements

are again being revived. Since they are completely inside the room and obstruct minimum light, they offer a positive advantage over the window unit. Because all the functions of a heat pump are present in an air-cooled room air conditioner, this feature, which was unsuccessfully offered in the early thirties, is again available as an optional extra.

Self-Contained Units: The self-contained unit has changed little during its 20-year existence. It was conceived for smaller stores and restaurants, which had set the pace on commercial air conditioning. The requirements were simple — minimum floor space, unobstructed air flow, and styling suitable for location within the room.

Today's self-contained unit looks much like its 1936 predecessor. Internal improvements have been similar to room air conditioners, including hermetic compressors, a trend toward capillary expansion devices, and improved electric motors and control Recently there has been more emphasis on styling. In the early thirties, casings were primarily functional, whereas today, units up to about 7-½ hp are styled to blend inconspicuously with most kinds of decor.

Until recently all self-contained units were water-cooled, using city water to waste or a cooling tower. Within the past 5 years there has been a trend toward air-cooled models. Since a one-piece air-cooled package is bulky and poorly suited to the small store which does not have ready access to outdoor condenser air, most air-cooled models are 2-piece. The condenser is remotely located, and the 2 packages are interconnected by refrigerant piping.

In the post-war period there has been the start of a trend toward ceiling suspended units, paced by the needs of chain stores where profit margins require every possible square foot of floor area for merchandise. More recently the range of sizes has been expanded up through 15 tons for equipment located within the room, and considerably larger for units located outside the room. This trend has been made possible by increased manufacturing volume, which has reduced costs below field-assembled components. This has resulted in cost savings to the consumer, who today finds scant justification for assembling components below 25 tons in one unit. In fact, the economics often permit large installations to be best served by a multiplicity of small self-contained units.

Heat Pump: The specialized self-contained unit called the packaged heat pump is a phenomenon of the last 20 years. Early installations, like General Electric's first heat pump in 1935, were assembled systems using fan coil units or central system equipment and remote compressors.

Considering how long the basic knowledge and design requirements have been known and recognized, heat pumps have made rather slow progress. By 1944 less than 100 commercial and residential units had been installed. By 1950 they numbered less than 1,000, and every year since, rosy predictions have outrun actual sales.

The organization which has done most to promote the heat pump is the American Gas & Electric Service Corp. which in the early thirties recognized the basic economic advantages to the electric utility industry, pioneered many early installations, and has consistently promoted the idea. The relative slowness of the industry to take the ball and run with it has been due primarily to economic factors. Since the heat pump is a full-fledged cooling machine, the buyer has to be a prospect for summer cooling before he can justify a heat pump. But it is only during the last 5 years that the market for residential cooling has even begun to break.

The heat pump costs more than conventional equipment. Except in a few favored locations, operating cost during the heating season is substantially more than with conventional fuel. Cost reduction by mass production, as well as considerable sales promotion, will be required to overcome these elements of resistance.

During the past 7 or 8 years, water-cooled self-contained units have frequently been converted to water source heat pumps, and this has become a job shop business in certain parts of the country. But the water source pump is advantageous only where there is a cheap and plentiful source of well water, river, or lake water. While there are many such locations, they represent a small proportion of air conditioning prospects, and the market thus far has been confined to a relatively small area in the south.

The air source pump has not proved to be a simple conversion since the technical problems have been more difficult. Because available heat declines with decreasing outdoor temperature, while the heating requirement increases, the deficiency must be made up by supplemental heat; otherwise the heat pump becomes excessively large. The recent trend has been toward use of electric resistance heaters to supplement the heat pump at low outdoor temperatures. Much development work is now in process to overcome the outdoor coil frosting problem and to simplify the switch-over valve and control.

Two styles of air source heat pumps are currently offered. The one-piece heat pump combines all elements into a single but rather large package, thereby minimizing installation labor. However, it requires a location which has access to outside air for heat rejection. The first production air source unitary pump was introduced by Drayer-Hanson in 1945.

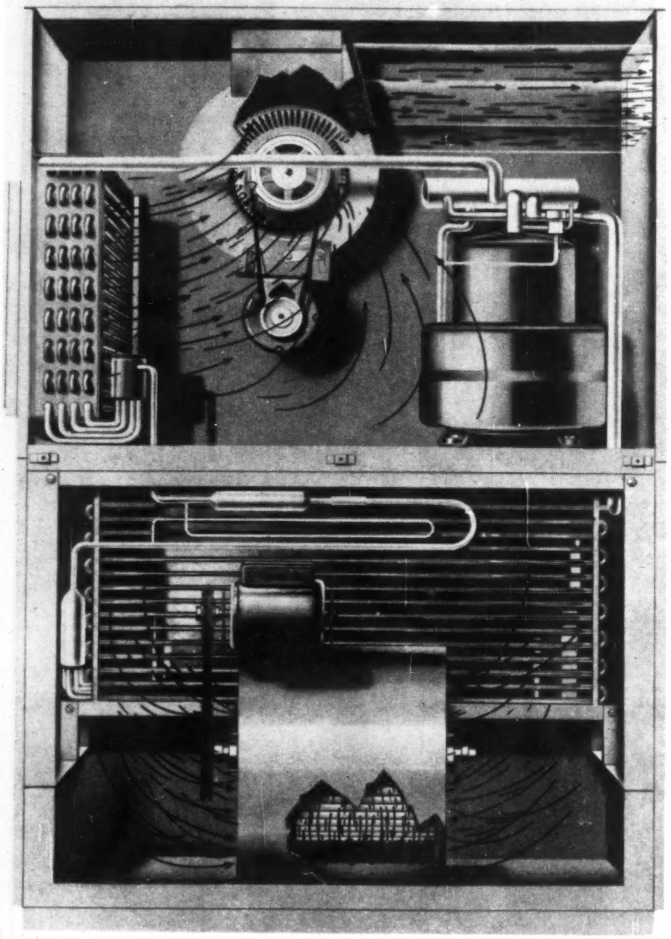


Fig. 13 — Single package air-to-air heat pump unit for homes and commercial establishments

The 2-piece heat pump comprises one package located outdoors or adjacent thereto for absorbing and dissipating heat, and an indoor package to heat and cool the house. The 2 packages are interconnected with refrigerating piping.

Fan Coil Units: Nothing revolutionary has occurred in the design of fan coil units during the past 20 years. Their pattern was established in the early thirties in both the small room unit and the larger remotely located unit. In both categories there has been an increase in varieties and sizes available, better to meet the many application requirements of the remote systems they serve. One notable improvement is the *zoning type* fan coil unit with a multiplicity of dampered supply connections to serve a corresponding number of zoned spaces. Other improvements in fan coil equipment parallel those in self-contained units.

Small and large fan coil units, which are bread and butter business to the industry, have proved very advantageous in large commercial and industrial buildings where a central source of chilled water is used. There is also a market for room type units in residences.

[*In the next portion of his paper the author deals with Heating Equipment; Air Purification, Moving, and Distribution Equipment; Heat Exchange Surface; Refrigeration Equipment; Water Conservation Equipment; and Automatic Controls.*]

1956 ANNUAL REPORT OF COMMITTEE ON RESEARCH

By B. H. Jennings, Chairman, and E. R. Kaiser, Director of Research

Air conditioning is a product of research.

The increased demand for modern heating, ventilating and space cooling has brought with it many new requirements for basic technical information that only research can supply. Product designers and application consultants need more fundamental information on periodic heat flow into buildings, solar heat gain through new fenestrations, noise measurement, air distribution patterns, and countless other factors for which present data are inadequate. At the same time industry and the public are asking for measured proof of other benefits from air conditioning in addition to comfort.

To develop and provide fundamental data, the Society conducts and sponsors its research program with participation by its membership, by industry and by consulting engineers; with the central laboratory at Cleveland serving as the coordinating center of the program.

The Committee on Research which has overall responsibility for the Society's research activity is pleased to present here in brief the progress and plans made during the fiscal year, November 1, 1955 to October 31, 1956.

Ten projects at the Laboratory in Cleveland, Ohio and 10 projects at co-operating institutions were supported. Seven of the 10 projects at the Society's Laboratory were begun in 1956, replacing some completed during the previous year. Eleven technical papers, listed later in this report, were completed for publication.

The Technical Advisory Committees (TACs) and subcommittees held 28 meetings during the year, a new high in activity. The Committee on Research and Research Executive Committee met 8 times. The TACs are urged to suggest and evaluate opportunities for new research projects, and to review the progress of the laboratories. Their recommendations for new projects are carefully considered for activation by the Committee on Research. More than 275 engineers participate on the research committees.

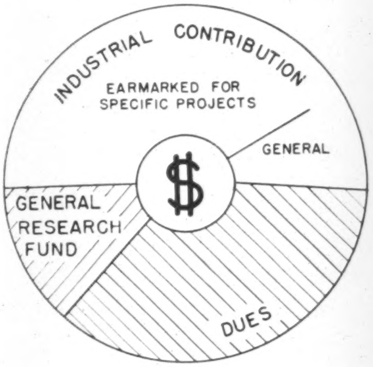


Fig. 1 — Sources of Society research funds — Total $215,000

Expenditures and Finances

In round figures, research expenditures totaled $214,000 for the year as compared with $205,000 in 1955. The receipts from contributions alone were $115,000 with the remainder of the support coming from income from dues and the research reserve allocated for laboratory use. The supporting companies, consultants and trade associations who contributed funds numbered 201. Ten companies made gifts or loans of equipment. Acknowledgments of the vital participation of these groups is given with sincere thanks. The Committee on Research invites further participation in research from industry and from the profession.

With the assistance of the staff and committees, the director of research extends current programs and prepares new programs. All research is sponsored or conducted on a not-for-profit basis and all results are published and widely disseminated.

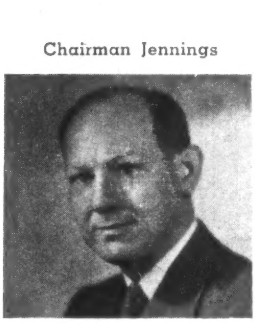
The current staff at the laboratory consists of 6 engineers, 3 research assistants, 4 on the administrative staff, a librarian and 6 in the secretarial and maintenance personnel.

Air Cleaning

University of Minnesota: In collaboration with the air-filter industry, the Society has continued its sponsorship of the study of air contaminants. A. B. Algren and K. T. Whitby have furthered the development of laboratory and field techniques for sampling and analyzing atmospheric dust, and for determining the dust-holding capabilities of air filters.

An improved photometer was produced and described for evaluating air cleaners by the dust-spot method. For accurate work glass fiber and

Chairman Jennings



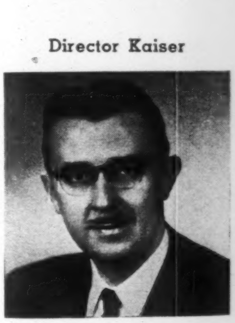
Committee on Research: B. H. Jennings, Chairman; H. A. Lockhart, Vice Chairman.

Three years: F. H. Faust, F. K. Hick, M.D., R. C. Jordan, H. A. Lockhart, Arthur Nutting.

Two years: R. C. Chewning, W. S. Harris, N. B. Hutcheon, B. H. Jennings, P. H. Yeomans.

One year: John Everetts, Jr., W. F. Friend, Carl F. Kayan, H. R. Limbacher, E. F. Snyder, Jr.

Director Kaiser



millipore filters have been found to be superior to the chemical filter papers ordinarily used. Notes on the centrifuge size analysis of dust collected on millipore filters have also been exchanged with other investigators now using the centrifuge sedimentation method of dust analysis developed by the University.

A field survey of atmospheric dusts is in progress at 7 locations over the country, the samples from these locations will be analyzed for size distribution and other features.

A new dust feeder for testing air filters has been under development for better dispersion of test dusts than is possible with feeders now in use. Dispersion is to be obtained in an air nozzle where conditions of high turbulence and expansion exist. The dust survey and the feeder project are expected to lead to recommendations for test dusts that simulate the range of atmospheric particulate matter normally encountered in practice.

A study was also made of the basic physical phenomena by which small particles are trapped in fibrous filters.

Air Distribution

The prediction of flow patterns of air streams for grilles and nozzles is basic to satisfactory air conditioning design. Projects in this area were sponsored at two institutions.

Case Institute of Technology: Alfred Koestel and J. B. Austin, Jr., reported on an experimental study of two closely-spaced parallel air jets under isothermal conditions. The jets merged at now-predictable distances from the nozzles. Equations were presented to enable a designer to predetermine the velocities in the jet stream at various distances from the openings.

An investigation of air patterns from radial-flow outlets has been completed, as has a study of room heating by warm air at near 100 F. Reports are now in preparation.

Kansas State College: Linn Helander and associates reported on the outlet characteristics that affect downthrow of heated air jets, such as from grilles and unit heaters. A simple and quick means was presented for measuring the thrust or projective force developed by outlets. Flow characteristics, velocity distribution downstream, and the influence of cores in the jet were given.

The project is being completed in 1957. A much better understanding of vertical air streams has resulted from the 5 papers issued to date.

The TAC on Air Distribution is considering the publication of a bulletin on air distribution in rooms, and new research on high-velocity air systems.

Combustion

Combustion noise from residential boilers and warm-air furnaces heated by oil and gas burners is being in-

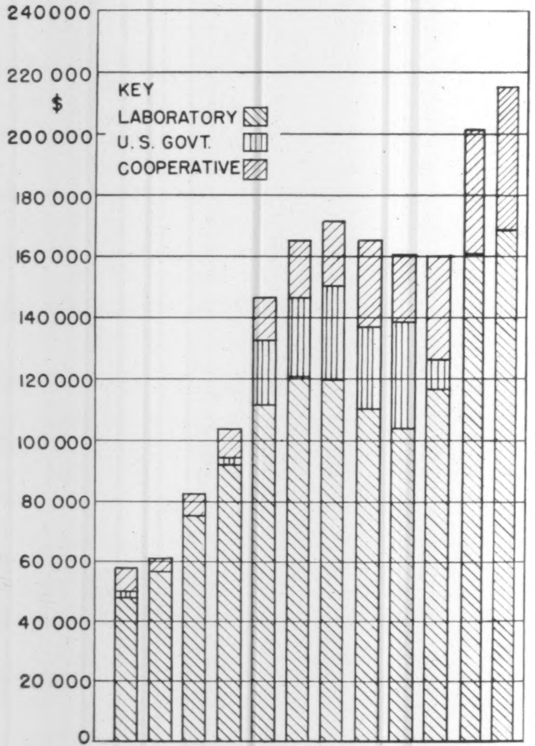


Fig. 2 — Chart showing the nature of Society research expenditures during the years 1945 to 1956

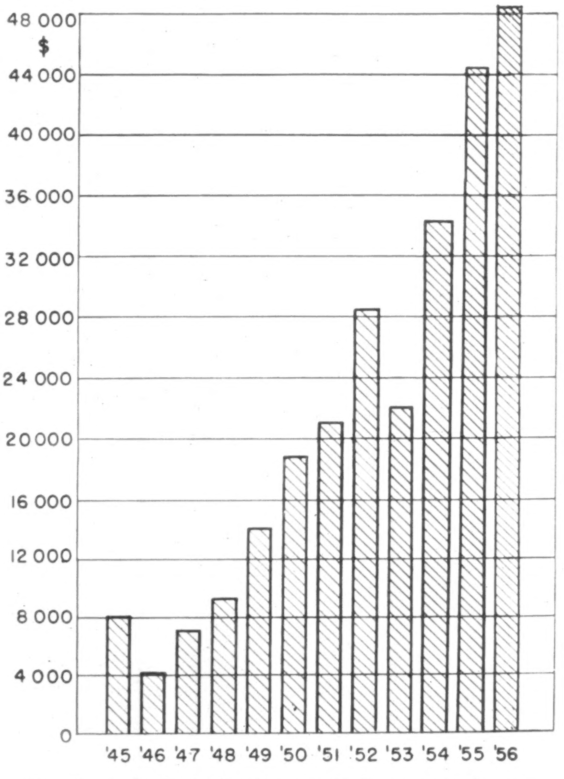


Fig. 3 — A chart showing grants to co-operative research during the years 1945 to 1956

vestigated at Battelle Memorial Institute. Objectives are to define the fundamental nature of the audible pulsations and to find methods for their suppression or complete elimination. A furnace or boiler which develops pulsation patterns may be so noisy as to be heard or felt throughout a building. The resonant frequency of the room and the location of the furnace in the room also make large differences in the apparent noise level.

For the oil-fired unit, the important factors in oscillations appear to be (1) the relative flow patterns of combustion air, hot products of combustion, and fuel, and (2) the relative positions of the combustion zone and the pressure antinode. Motion pictures were taken to show the periodic, rapid, flame expansions.

For the gas-fired unit, the most important variable appears to be the rate of flow of primary air. The driving mechanism for the oscillations is related to vortex shedding of the flame.

Many variables in burner design and operation, such as spray angle of nozzles, burner tubes, fans and others have been investigated, as well as combustion space, length of gas travel, and location of barometric damper.

The project is continuing into 1957 with guidance from the Pulsations Steering Committee of the TAC on Combustion.

Heating and Air-Conditioning Loads

A major program is in progress by T. C. Min at the Research Laboratory to determine the infiltration through swinging-door entrances of commercial-type buildings during both winter-heating and summer-cooling regimes. Preliminary results confirm that the stack effect of tall buildings is governed almost directly by the building height and indoor-outdoor temperature difference. The time-motion cycle of door openings will be measured by motion pictures during normal traffic flow. Models of doors and vestibules have been employed in a wind tunnel to measure the air flow at various door angles. By combining the findings on draft, traffic, and door motions, it will be possible to formulate rules for estimating infiltration and their resultant effect on air-conditioning loads.

University of Illinois: Air infiltration of modern small residences, both single and two-story, has been investigated by the tracer-gas technique. The tests were run by injecting a quantity of helium into the house air and noting the decline in helium concentration as the air in the house was gradually diluted by outside air. The infiltration increased somewhat with wind velocity and with indoor-outdoor temperature difference, roughly doubling with a 50 F increase in temperature difference. The magnitude of infiltration ranged mainly between 0.2 and 0.6 air change per hour.

Heat Flow Through Fenestration

The Society operates the only known solar calorimeter especially designed to measure the heat transfer through windows and skylights. The results are expressed directly in energy units of Btu per (square foot) (hour) or in percent of incident radiant energy which reaches the space beyond the inside surface. The effectiveness of awnings, Venetian blinds, shade screens, and other shading devices can also be determined with it.

After 10 years of use, the solar calorimeter was thoroughly overhauled and returned to working condition by September 1. Improvements were added to reduce future maintenance and to increase accuracy. Fortunately, favorable weather in abundance was available during September and October to conduct tests of certain shading devices.

Plans have been made to complete the study of awnings during the summer of 1957. Their effectiveness in reducing solar load through windows is known to be high but definite values are needed for analyses of the many variable factors entering into this problem.

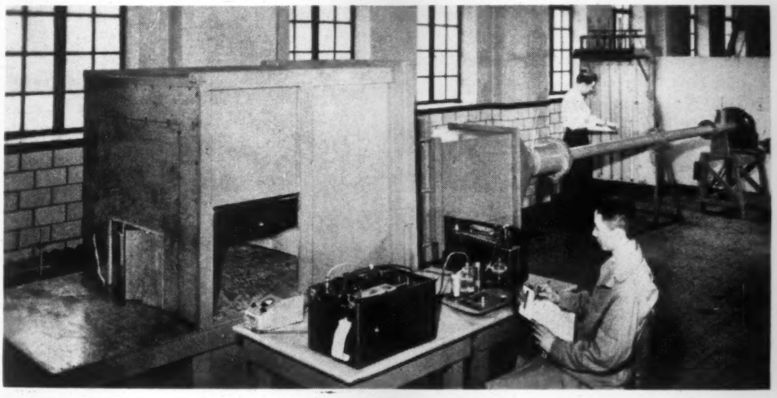
Preparations are also under way to measure the solar heat gain next summer of double glazing with between-glass shading devices, such as Venetian blinds and shade screens. Consideration is also being given to tests of reflective surfaces behind glass, and to the new forms of clear and glass-fiber-reinforced plastic fenestrations.

The diffuse solar radiation striking inclined surfaces, such as roofs and skylights, will be predictable for purposes of air-conditioning load calculation as the result of a study by A. N. Cerny now nearing completion.

Hot Water and Steam Heating

The table on capacity of steam piping in The Guide which has been

Fig. 4 — Entrance infiltration through swinging doors is being measured at the Research Laboratory. Models one-sixth size simulate full-scale doors



widely used is based on both tests and field experience. However, it appears desirable occasionally to compare these values with present application practices to determine whether the factors of safety are still most representative. Such a study is now under way at the Research Laboratory with guidance from the TAC on Hot Water and Steam Heating.

University of Illinois: W. S. Harris is investigating the separation of dissolved gas from water in a one-pipe forced-circulation hot water heating system, and the entrainment of gas by water as it moves through the system. Both radiators and convectors have been used. More gas was formed at higher water temperatures, and more gas appears to separate from radiators than from convectors. As the return of gas to the compression tank is desirable, future tests propose locating the tank closer to the boiler and installing a dip tube in the boiler, with piping to the tank.

University of Florida: J. D. Simonds has been investigating air locks and air entrainment in hot water heating systems containing both radiators and convectors. Additional tests will be required before final conclusions can be reached.

Northwestern University: The test work on metastable state of water at boiling temperatures has been completed. The report will state the conditions under which the metastable state has been observed.

It is also planned to resume test work on noise in pipe systems during 1957.

Industrial Environment

University of Pittsburgh: A basis for determining the requirements for exhaust ventilation of hot processes in industry has been sought for some time. The air streams flowing upward around a hot ingot or tank carry excess heat and often dust particles, fumes, and gases which contaminate the air in the plant.

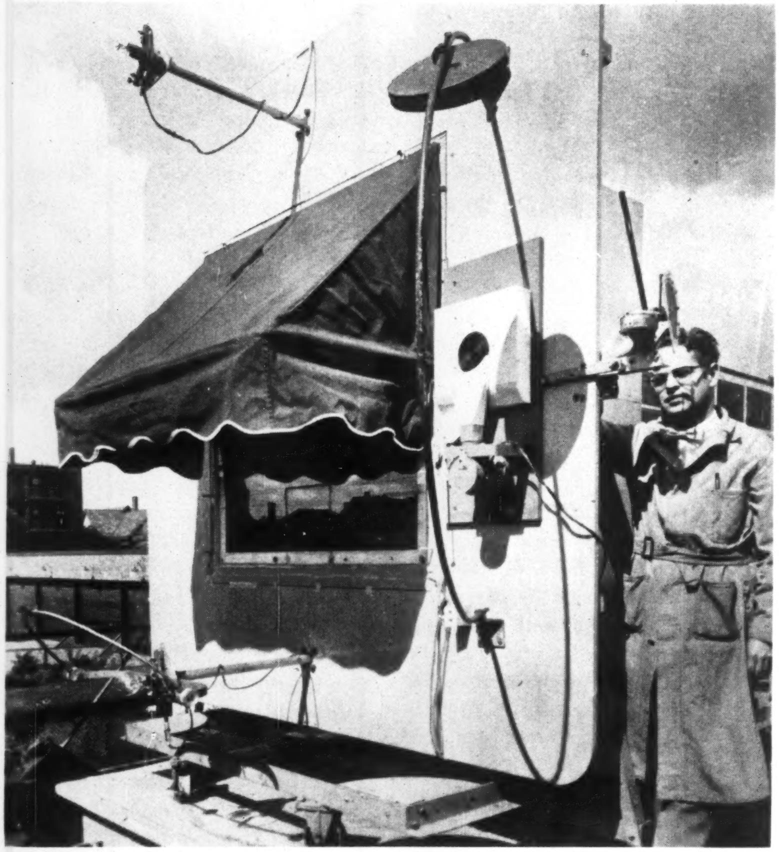
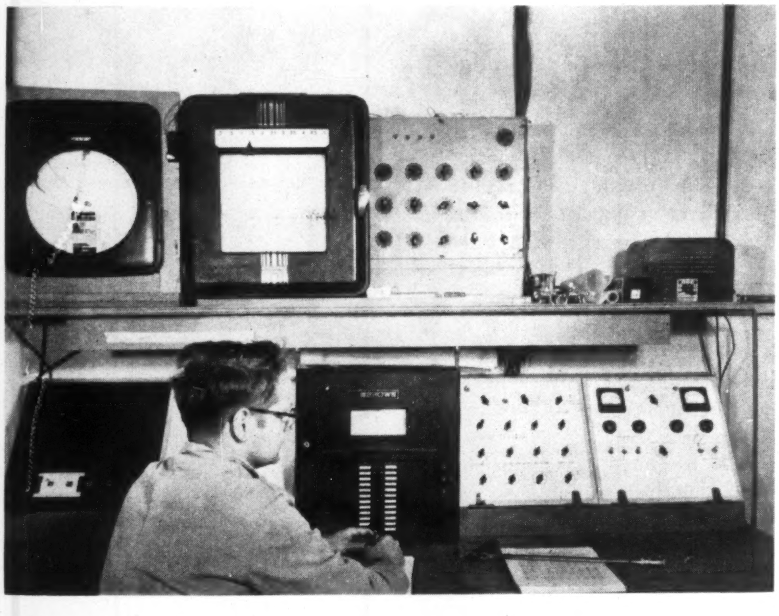


Fig. 5 — Solar calorimeter in use with canvas awning. Direct solar and diffuse sky radiation measured by pyrheliometers. Calorimeter measures net heat entering space behind window

Fig. 6 — Instrumentation for solar calorimeter is located in test house under calorimeter



The paper on *Air Flow in Free Convection Over Heated Bodies*, by T. F. Hatch and D. B. Barron-Oronzco, reports the results of a laboratory study. A general equation was produced to express the findings for practical design purposes. Exhaust-hood size and rate of exhaust ventilation can be calculated for a variety of conditions with allowance being made for cross drafts.

The University is currently engaged in a study of lateral exhaust ventilation with Society support.

Insulation

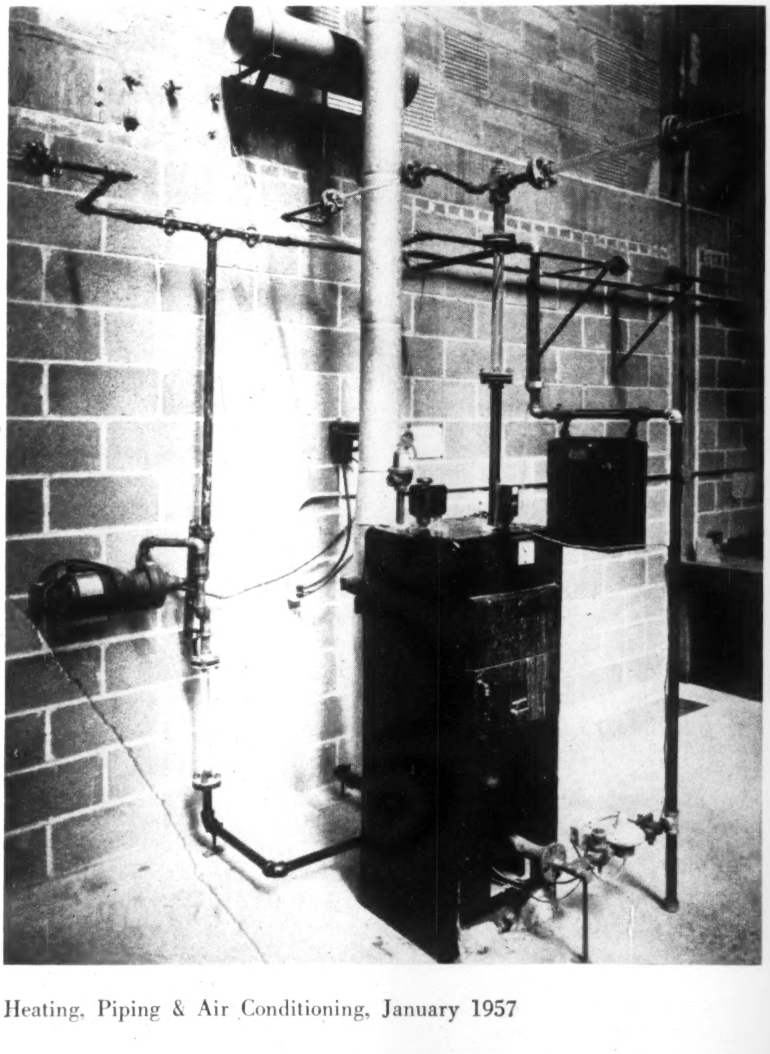
The Guide 1957 will contain the full fruits of the latest work of the TAC on Insulation. The newly-computed U values of overall-heat-transfer coefficients through building sections will be available in a more readily useable form for the benefit of architects and engineers, trade associations and manufacturers.

The TAC has recommended field and laboratory investigations of (1) perimeter insulation for slabs-on-grade, (2) loose fill insulation in walls, (3) crawl-space insulation, and (4) attic ventilation and insulation. The objective is to determine how conditions of use influence actual heat-flow magnitudes.

Odor Studies

The paper on *Temperature and Humidity Effect on Odor Perception*, by Messrs. Kerka and Humphreys of the Society's Research Laboratory, reported revolutionary findings. Contrary to popular opinion, at a given concentration of odorant an increase in humidity has the definite effect of lowering the odor-perception level of cigarette smoke as well as of the pure odorant vapors tested.

Fig. 7 — Gas generation and movement in hot-water heating systems is being investigated at University of Illinois. Note glass sections in piping



Other factors remaining constant, a 10-fold increase in concentration of odorant in the air changes the perception from barely *noticeable* to *definite*, while a 100-fold increase changes the perception from *noticeable* to *strong*. Exposure to an odor for as short as one minute caused a reduction in odor sensation equal to about 10-fold reduction in odor concentration.

Plans have been made with the TAC on Odors to continue the odor research with studies of odor adsorption and desorption by cotton, wool, and synthetic fabrics. Among the variables are odorant, temperature, humidity, time and ventilation. The Society's 2 odor test rooms have been equipped with automatic temperature and humidity control for that purpose. The adsorption and retention of odors by fabrics in room furnishings, namely rugs, upholstery and drapes, are important factors in odor control.

Panel Heating and Cooling

The research in the completely paneled Environment Room resulted in three papers during the year.

Simplified procedures were reported in the paper, *Thermal Design of Warm-Water Concrete Floor Panels*, by the TAC on Panel Heating and Cooling and the ASHAE Research Laboratory Staff. With room-air temperature as the selected criterion for comfort, the procedures were given for calculating piping, mean water temperature and Btu rates required for slab-on-grade and intermediate slab floors.

Cold Wall Effects in a Ceiling-Panel-Heated Room, by L. F. Schutrum and T. C. Min of the Research Laboratory, gave quantitative results on air currents flowing down an exposed inside wall. The ceiling was heated by panels extending from the cold wall 1/3, 2/3 and full room width. In the living space variations in room-air temperatures were found to be small and room-air velocities were negligible except near the floor. Mean radiant temperatures were in general higher than the room-air temperatures.

A survey of plastic pipe usage, which was made, indicates that such pipe is under test by several organizations for use in heating concrete floor slabs. Satisfactory results are reported from installations up to 4 years old. Care must be taken to protect the pipe from rodents and to limit the upper water temperatures to about 160 F.

The overall program which began in 1949 will be completed with a paper on the heat transfer from fluorescent lighting fixtures to a cooled panel.

Sensations of Comfort and Physiological Research

The Comfort and Effective Temperature Charts of the Society have long served as an index to thermal environments. With the spread of air conditioning under a wide variety of conditions not fully explored at the time the charts were produced, additional information appears to be needed.

A major undertaking was launched during 1956 for a 10-year program of tests with human subjects on the effect of indoor thermal environment on comfort and human performance. The 12x24.5-ft Environment Room with temperature controlled walls, floor, and ceiling is being equipped with more flexible and extensive air-conditioning system to provide a wide range of temperatures, humidities, air motion and radiation.

Two air-conditioned pretest rooms are being constructed to provide a controlled environment for rest and to normalize body temperatures and clothing moisture before the tests. Adjacent to the test and pretest area an observation room in a central location is being provided for the research force. The control of the equipment to provide specified environment regime will be centralized in a control console.

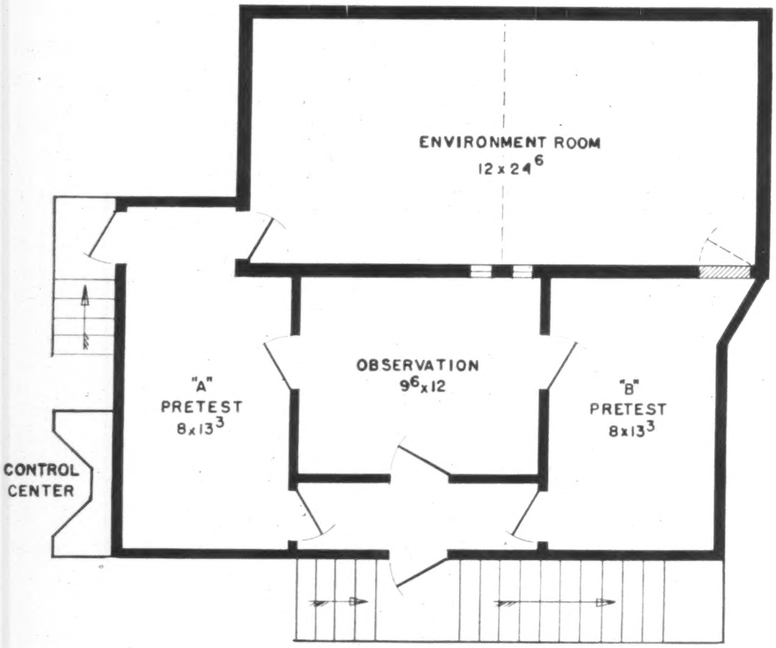


Fig. 8 — Plan view of rooms at Research Laboratory for studies of human comfort and performance in controlled thermal environments

Separate air-conditioning circuits for the Environment Room and pretest-observation areas have been designed for automatic and close control of air temperature, humidity, and motion, as well as of room surface temperatures.

The several projects to be undertaken over a period of years include:

1. Effect of humidity on comfort while subjects are (*a*) at rest, and (*b*) engaged in light activities.
2. Effect of ceiling and wall temperatures (radiation) on comfort while subjects are (*a*) at rest, and (*b*) engaged in light activities.
3. Optimum thermal environments for comfort while subjects are working at elevated rates of bodily heat output.
4. Effect of thermal environments on human performance and efficiency, such as alertness, learning, accuracy of work, fatigue and stress.

The detailed programs are being prepared by Nathaniel Glickman, consulting physiologist, with the cooperation of the TACs on Sensations of Comfort, Industrial Environment and Physiological Research.

Solar Energy Collectors

University of Minnesota: Solar radiation is a promising source of energy for heating buildings and service water, as well as for absorption cooling systems. Of the many problems involved in harnessing solar energy, two of the more important ones are (1) the extent and availability of the energy supply, and (2) the design and performance of flat-plate collectors.

The University has installed two such collectors, 7 ft-1 in. wide by 3 ft-3 in. high, with refrigeration systems and instrumentation for measuring collector performance under a variety of conditions. R. C. Jordan and J. L. Threlkeld have described the facilities in a recent paper to the Society. The experimental work is now under way and

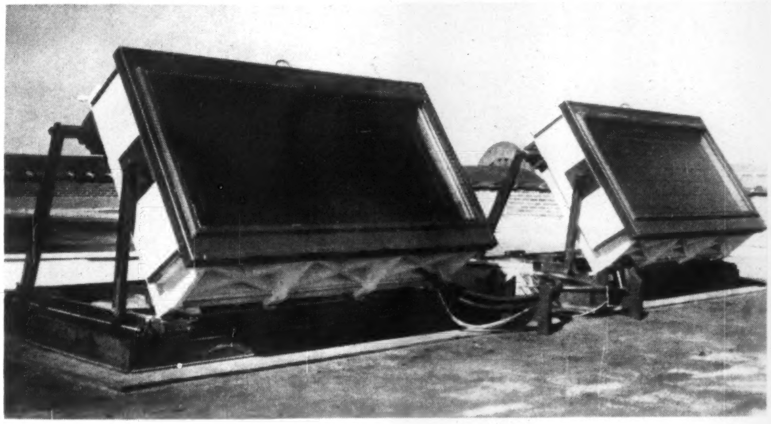


Fig. 9 — Solar heat collectors at University of Minnesota. Heat from sunshine is trapped by black tubed surfaces behind double glazing

is expected to provide basic information over a period of years that will be applicable for a wide geographical area.

In the meantime the TAC on Solar Energy is preparing a report on the *Solar Energy Utilization for Heating, Cooling, Distillation and Drying.*

Sorption Dehumidification

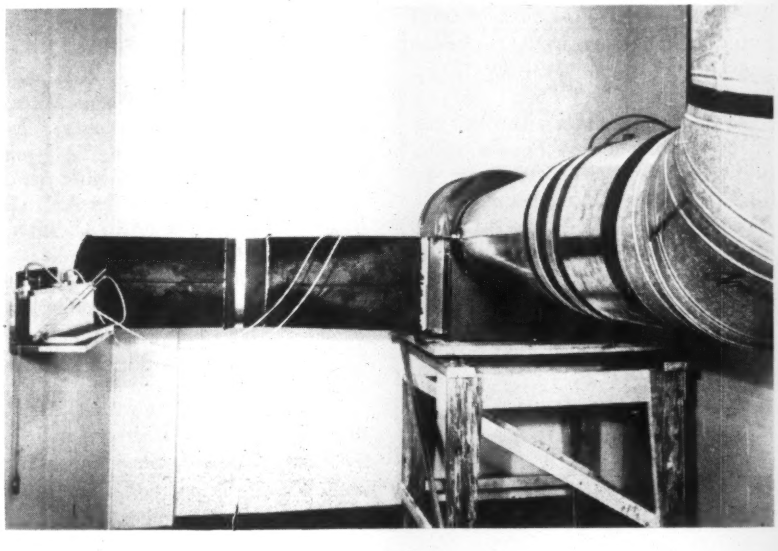
A proposed test code on sorption dehumidifiers has been modified by the TAC on Sorption since receiving the test program report from The Pennsylvania State University.

The TAC has also recommended research to determine the effectiveness of the sorption dehumidification cycle on the destruction of micro-organisms in the air being dehumidified. Low humidities are known to destroy some bacteria in a rather short time. Certain temperature ranges during the regeneration of the sorbent are also lethal to bacteria. The overall sterilization under dynamic conditions needs to be determined. The project is scheduled for activation in 1957.

Sound and Vibration Control

A practical, yet scientific, method for measuring the noise radiated by fans and allied air-conditioning equipment has been needed for a long time. To lay the foundation for a method that could be standardized, W. F. Kerka of the Research Laboratory has investigated the noise output of a 15-in. centrifugal fan by the four methods recommended by the TAC on Sound and Vibration Control:

Fig. 10 — Fan and duct system in sound-isolation room. Noise transmitted into air stream is measured outside the fan room



1. Free-field test. The acoustic power radiated into a free space from the opening of the inlet and discharge ducts was determined by taking measurements around the end of the duct at 4 and 8 ft radii.
2. Reverberant-room test. The acoustic power radiated into a reverberant room from the duct openings was determined from measurements made in the space. The room was calibrated with a standard noise source of known acoustic output.
3. Duct-opening test. The acoustic power at the duct opening was found by taking measurements around the periphery of the duct opening, with and without air flow, and across the duct face at no flow. From these measurements, acoustic power at the duct opening with flow was found.
4. Duct test. The acoustic power transmitted down the duct was found by taking measurements in the airstream with a shielded microphone. A sound-absorbing termination was used at the end of the duct.

The decibel readings were taken for octave bands of sound frequencies over a total range of 20 to 9600 cps, and converted to watts of sound power for comparison. Correlated results were obtained by the reverberant-room and free-field methods, usable for unit heaters and other unducted equipment.

The technique of measuring of noise in a duct will be useful in the study of noise regeneration and attenuation in components of duct systems, to be undertaken in 1957.

Thermal Circuits

A systematic research procedure for dealing with problems in cyclic heat flow through building sections, as well as heat exchanges in rooms, has been amply demonstrated in several papers on thermal circuits. Many of the equations are exceedingly complex and laborious. Messrs. Parmelee, Vance, and Cerny have demonstrated the use of the electronic differential analyzer for solving the problems in air conditioning with suitable accuracy. Other types of modern calculators and analogue computers are also useful.

The thermal-circuit technique has also been applied to heat-flow data for glass-block skylights. A forthcoming paper will analyze the heat flow and permit calculation of results for a variety of glass blocks.

The TAC on Thermal Circuits is considering a possible program to evaluate the thermal performance of building walls when the outside is subjected to solar radiation and the inside space is air conditioned.

University of California: H. A. Buchberg is expanding his thermal-circuit analysis of buildings and building sections to include control performance and wishes to extend the analyses to multi-room buildings.

Weather Data

The TAC on Weather Data has adopted as its scope *the accumulation and editing of weather data for heating, ventilating, and air-conditioning design and operation*. In cooperation with the Weather Bureau and Air Force, new tabulations of winter and summer data are to be prepared for The Guide. A report on winter design data is in preparation which will summarize the probable frequency of recurrence of given temperatures at selected locations.

Close collaboration is being maintained with committees of the *National Research Council of Canada* and the *Building Research Advisory Board*.

ASHAE Washington Meeting Papers, June 1956

ASHAE Research Report No. 1580—Air Velocities in Two Parallel Ventilating Jets, by Alfred Koestel and J. B. Austin, Jr. (ASHAE Transactions, Vol. 62, 1956, p. 425).

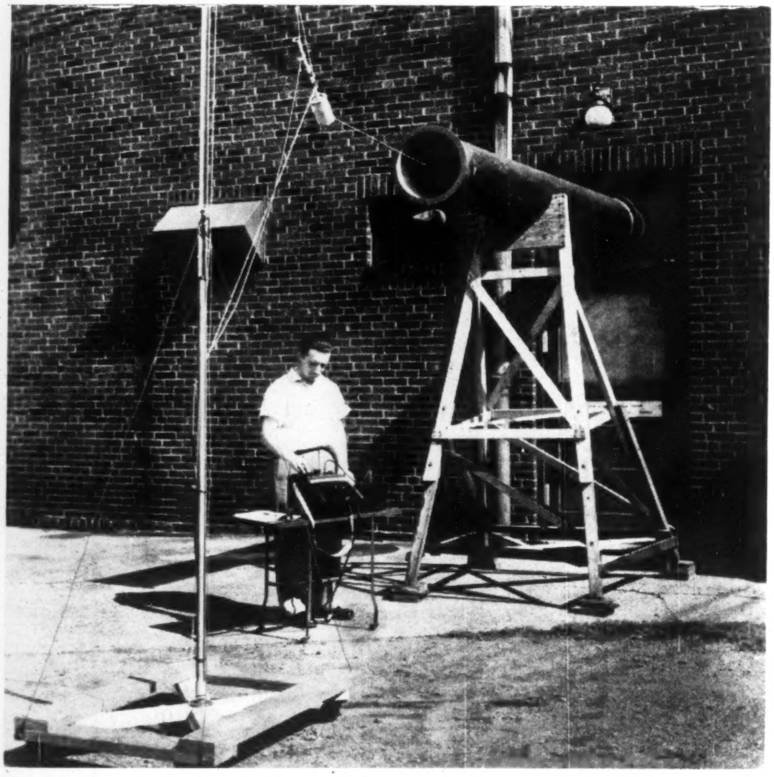


Fig. 11 — Measuring the sound power of a fan under free-field conditions. Microphone is suspended at constant radius from the end of duct

ASHAE Research Report No. 1587—Temperature and Humidity Effect on Odor Perception, by W. F. Kerka and C. M. Humphreys (ASHAE Transactions, Vol. 62, 1956, p. 531).

ASHAE Research Report No. 1583—Laboratory for Solar Energy Study at Minnesota, by R. C. Jordan and J. L. Threlkeld (ASHAE Transactions, Vol. 62, 1956, p. 461).

ASHAE Research Report No. 1576—Natural Convection and Radiation in a Panel-Heated Room, by T. C. Min, L. F. Schutrum, G. V. Parmelee and J. D. Vouris (ASHAE Transactions, Vol. 62, 1956, p. 337).

ASHAE Papers for Chicago Meeting, February 1957

Pulsations in Residential Heating Equipment, Preliminary Results, by A. A. Putnam and W. R. Dennis (ASHAE Journal Section, July 1956).

Cold Wall Effects in a Ceiling-Panel-Heated Room, by L. F. Schutrum and T. C. Min (ASHAE Journal Section, August 1956).

Analysis of an Air-Conditioning Thermal Circuit by an Electronic Differential Analyzer, by G. V. Parmelee, P. Vance, and A. N. Cerny (ASHAE Journal Section, September 1956).

Air Flow in Free Convection over Heated Bodies, by T. F. Hatch and D. Barron-Oronzco (ASHAE Journal Section, October 1956).

Thermal Design of Warm Water Concrete Floor Panels, prepared by a Subcommittee of the TAC on Panel Heating and Cooling and Members of the Staff of the ASHAE Research Laboratory (ASHAE Journal Section, October 1956).

A Study of the Dust Spot Method for Evaluating Air Cleaners, by K. T. Whitby, A. B. Algren and R. C. Jordan (ASHAE Journal Section, November 1956).

Outlet Characteristics that Affect the Downthrow of Heated Air Jets, by Linn Helander, Shee-Mang Yen and Wilson Tripp (ASHAE Journal Section, December 1956).

ASHAE RESEARCH PROJECTS — 1957

1. Air Cleaning

New methods for obtaining samples of atmospheric contaminants and for measuring particle-size ranges. Air cleaner performance.

2. Air Distribution

Flow patterns of heated and cooled air issuing into rooms from grilles and from unit heaters.

3. Combustion

A program concerned with studying and preventing pulsation noises and resonance in oil- and gas-fired heating equipment.

4. Comfort and Physiological Research

A major program has been launched to evaluate in the Laboratory the effects of temperature, humidity, air motion, and radiation on sensations of comfort and on physiological response.

5. Cooling

More accurate calculation of summer cooling loads in buildings by new thermal-circuit technique.

6. Dehumidification

The effectiveness of sorption dehumidification in sterilizing air is planned for early activation. A preliminary performance code for sorbent-type dehumidifiers has been developed.

7. Fan Noise and Duct Systems

Techniques for measuring the noise output of fans have been investigated, and a selection of the most suitable methods is to be standardized. A project on attenuation and regeneration of noise in duct systems will also be undertaken.

8. Heat Transfer through Fenestration

Skylights, between-glass shading, metal and canvas awnings, and plastics are to be tested to measure solar heat gain.

To meet the needs of industry, the profession, and the public, the AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS conducts a growing research program. The projects listed here are currently in progress under a budget of $260,180 for the year.

This program is carried out at the Research Laboratory of the Society and at the laboratories of various carefully selected and competent cooperating institutions.

The results are published and immediately made available to Society members, to the industry, and to the general public.

Financial support is primarily from the membership of the Society with generous allocation of funds from companies and trade associations.

For further information concerning any of these projects, write the Director of Research, ASHAE Research Laboratory, 7218 Euclid Ave., Cleveland 3, Ohio.

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9. Solar Heat Collectors

Sunshine is a source of winter heat for the heat pump and direct use. Solar collector performance is being evaluated by tests.

10. Hot Water Heating Systems

Gas movement, venting, and gas return to expansion tanks are under investigation.

11. Industrial Ventilation

Research on heat and fume removal from hot masses and tanks by lateral exhaust ventilation is in progress.

12. Infiltration in Commercial Buildings

Infiltration through door openings of public and commercial buildings, single and multi-story, is being measured.

13. Infiltration in Residences

Helium is used as a tracer gas to measure infiltration (and exfiltration) in residences.

14. Insulation

A library investigation of the performance of insulation in residential floor slabs, crawl spaces, walls and attics is contemplated.

15. Metastable State of Water

A study of sudden violent boiling under special conditions in heating systems.

16. Odor Adsorption

The adsorption and desorption of odors by fabrics is to be measured. Among factors to be studied are type of fabric, odorant, temperature, humidity, time, and ventilation.

17. Panel Cooling

A report of tests is being prepared on the effect of lighting and cool-air introduction to a room with ceiling panel cooling.

18. Weather Data

New data and tabulations for maximum usefulness to heating and air-conditioning engineers.

A Few Short Weeks Until 63rd Annual Meeting

February 25-28, 1957

Soon Society members, families and friends will arrive in Chicago for the 63rd Annual Meeting and the 13th International Heating and Air-Conditioning Exposition, February 25 - March 1, 1957.

The Registration Desk opens at 10:00 a.m. Sunday, February 24. Pres. John W. James, Chicago, calls the 63rd Annual Meeting to order on Monday morning. Subsequent sessions will be conducted by 1st Vice Pres. P. B. Gordon, 2nd Vice Pres. E. R. Queer and Treas. R. A. Sherman. There are 6 sessions all scheduled for the mornings, consisting of 2 symposiums and 13 papers.

P. J. Marschall, general chairman of the Illinois Chapter Committee on Arrangements, has announced a variety of special events. An enjoyable reception with a cheerful Hawaiian atmosphere takes place on Sunday afternoon.

The Monday Welcome Luncheon provides an opportunity to hear Dr. Richard Heflebower, chairman of the Economics Department, Northwestern University, discuss *Revolutions in Our Times — What Our Lives Will Be Like In The Next* 10 *Years.*

At 2:00 p.m. on Monday a Ladies' Talent and Tea in the Crystal Ballroom, Sheraton Blackstone Hotel, features a humorous monologue, *Crinoline & Crust,* by Purdie Nelson Meissner.

The Monday evening Get-Together Party offers dancing to the music of Henry Brandon, and other attractions.

Wednesday there is the Ladies Luncheon and Entertainment at the South Shore Country Club, and the Annual Banquet in the evening.

During the Annual Banquet the prominent and popular Dr. Preston A. Bradley, pastor of People's Church of Chicago, will deliver an inspiring address, *Facing The Future,* and President James will receive the Past President's Award, the 1957 officers of the Society will be introduced and installed, and M. K. Fahnestock will receive the F. Paul Anderson Medal.

PROGRAM*

Saturday — February 23

10:00 a.m. Executive Committee, P. B. Gordon, *Chairman*

2:00 p.m. Finance Committee, A. J. Hess, *Chairman*

2:00 p.m. Research Executive Committee, B. H. Jennings, *Chairman*

2:00 p.m. Regions Central Committee, E. R. Queer, *Chairman*

Sunday — February 24

10:00 a.m. REGISTRATION (*Beverly Room*)

10:00 a.m. Council Meeting (*Lipton Room — Stock Yards Inn*)

10:00 a.m. Committee on Research, B. H. Jennings, *Chairman*

3:00 p.m. Reception and Refreshments with an Hawaiian accent

Monday — February 25

9:00 a.m. REGISTRATION (*Normandy Lounge*)

9:30 a.m. FIRST SESSION (*Waldorf Room*)
Call to Order — Pres. John W. James

Greetings by P. J. Marschall, Chairman Committee on Arrangements
Report of President — John W. James
Report of Council — A. V. Hutchinson
Report of Treasurer — R. A. Sherman
Study of Three Redwood Cooling Tower Packings, by W. W. Smith
Earth as Heat Source and Sink for Heat Pumps, by D. M. Vestal, Jr. and B. J. Fluker
From '36 to '56: Air Conditioning Comes of Age, by W. A. Grant

12:00 noon WELCOME LUNCHEON (*Grand Ballroom*)
Toastmaster: C. M. Burnam, Jr.
Speaker: Dr. Richard Heflebower, Chairman, Economics Dept., Northwestern University

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*Registration, all Technical Sessions, and Meetings at The Conrad Hilton Hotel unless otherwise designated

Method of Choosing Location of, Financing and Conducting Meetings of the Society

Resolved: That inasmuch as the Annual and Semi-Annual Meetings of the Society come under the jurisdiction of the Council, the following rules governing the handling of such meetings be adopted by the Council and published in the Journal of the Society at least twice during every year, preferably just prior to each meeting.

1—The Council will select the city in which the Annual or Semi-Annual Meeting is to be held, giving due consideration to the invitations received from Chapters or members as well as to the advisability of so distributing those meetings as to make them of the greatest advantage to the general membership, and to reduce as far as possible the expense of members attending.

2—That an appropriation be made to cover the entertainment or local expenses, incurred in connection with the meeting, and the regular meeting expenses to be taken care of by the General Fund of the Society in the regular way.

3—That no registration fee or compulsory obligations of any nature be imposed on members or guests.

4—That the purchase of tickets for banquets or for any other form of entertainment that may be provided be entirely voluntary.

5—That the grouping of features and the sale of tickets for group features be discouraged.

6—That the raising of funds from manufacturers of heating apparatus be discouraged.

7—That the display of samples, or of literature, advertising the product of any manufacturer in any way, shape or form, be not permitted at the booths, registration desk, or in or about the meetings.

8—That the distribution of trade papers be entirely at the discretion of the committee in charge.

9—That the local Chapter or local members be empowered to form a General Committee with such sub-committees as may be required to handle the details of transportation, hotel accommodations, entertainment, finance, etc., and that this General Committee be requested to confer frequently with the Council, through the Executive Secretary of the Society, and to make frequent reports on progress in connection with the various matters being handled by them.

10—That the arrangements of elaborate and costly entertainment features be discouraged.

Adopted at Council Meeting, January 29, 1926.

2:00 p.m. EXPOSITION — Opening of 13th International Heating and Air Conditioning Exposition (*International Amphitheatre*). ASHAE Booth 701.

2:15 p.m. TAC on Air Cleaning, E. F. Snyder, Jr., *Chairman*

2:15 p.m. TAC on Air Distribution, W. O. Huebner, *Chairman*

2:15 p.m. TAC on Hot Water and Steam Heating, H. A. Lockhart, *Chairman*

2:15 p.m. TAC on Solar Energy Utilization, R. C. Jordan, *Chairman*

2:30 p.m. Ladies Talent and Tea (*Crystal Ballroom*, Sheraton Blackstone Hotel)

9:00 p.m. Get-Together Party (*Grand Ballroom*)

Tuesday — February 26

9:00 a.m. REGISTRATION (*Normandy Lounge*)

9:30 a.m. SECOND SESSION (*Waldorf Room*)
Call to Order — 1st Vice Pres. P. B. Gordon
Report of Committee on Research — B. H. Jennings, *Chairman*
Revised Winter Outside Design Temperatures, by H. C. S. Thom
Analysis of an Air-Conditioning Thermal Circuit by an Electronic Differential Analyzer, by G. V. Parmelee, P. Vance and A. N. Cerny (by title only)
Pulsations in Residential Heating Equipment — Preliminary Results, by A. A. Putnam and W. R. Dennis
The Dust Spot Method for Evaluating Air Cleaners, by K. T. Whitby, A. B. Algren and R. C. Jordan
Report of Tellers of Election

9:30 a.m. THIRD SESSION (*Grand Ballroom*)
Call to Order — Treas. R. A. Sherman
SYMPOSIUM ON DEHUMIDIFICATION
John Everetts, Jr., Moderator
Dehumidification by Refrigeration — Walter E. Ellis
Dehumidification by Solid Sorbents — W. L. Ross
Dehumidification by Liquid Sorbents — E. W. Gifford
Economics of Dehumidification as Related to Storage — G. A. Higgs
Typical Problems and Their Solution — E. R. Queer

12:00 noon EXPOSITION

12:15 p.m. Life Members' Dutch Treat Luncheon

1:30 p.m. Nominating Committee Meeting

2:00 p.m. Guide Committee, M. W. Keyes, *Chairman*

2:15 p.m. TAC on the Heat Pump, F. R. Ellenberger, *Chairman*

2:15 p.m. Joint meeting of TAC on Industrial Environment, P. J. Marschall, *Chairman*; and TAC on Physiological Research, M. K. Fahnestock, *Chairman*

2:15 p.m. TAC on Sorption, G. L. Simpson, *Chairman*

2:15 p.m. TAC on Sound and Vibration Control, H. A. Lockhart, *Chairman*

7:00 p.m. Past Presidents' Dinner

7:30 p.m. TAC on Heat Transfer Through Fenestration, R. W. McKinley, *Chairman*

7:30 p.m. TAC on Heating and Air Conditioning Loads, H. T. Gilkey, *Chairman*

7:30 p.m. TAC on Insulation, M. W. Keyes, *Chairman*

7:30 p.m. TAC on Thermal Circuits, S. F. Gilman, *Chairman*

7:30 p.m. TAC on Plant and Animal Husbandry, A. J. Hess, *Chairman*

Wednesday — February 27

9:00 a.m. REGISTRATION (*Normandy Lounge*)

9:30 a.m. FOURTH SESSION (*Waldorf Room*)
Call to Order — 1st Vice Pres. P. B. Gordon
Cold Wall Effects in a Ceiling-Panel-Heated Room, by L. F. Schutrum and T. C. Min
Performance of Covered Hot Water Floor Panels, Part II, by E. L. Sartain and W. S. Harris
Thermal Design of Warm Water Concrete Floor Panels — A Design Manual prepared by a subcommittee of TAC on Panel Heating and Cooling and members of the staff of the ASHAE Research Laboratory

9:30 a.m. FIFTH SESSION (*Grand Ballroom*)
Call to Order — 2nd Vice Pres. E. R. Queer
INDUSTRIAL VENTILATION SYMPOSIUM
C. H. Pesterfield, Moderator
Control of the Industrial Environment — P. J. Marschall
Local and General Atmospheric Contaminants Control — K. E. Robinson
Cleaning Industrial Effluent — J. M. Kane
Summer-Winter Comfort Ventilation for Industry — B. R. Small
The Inertia of Dust Particles and Various Consequences — W. C. L. Hemeon

12:00 noon EXPOSITION

12:30 p.m. Ladies Luncheon and Entertainment (South Shore Country Club)

2:00 p.m. Committee on Research, B. H. Jennings, *Chairman*

7:00 p.m. ANNUAL BANQUET (*Grand Ballroom*)
Toastmaster: W. A. Kuechenberg
Speaker: Dr. Preston Bradley, Pastor of Peoples Church, Chicago
Introduction and Installation of 1957 officers
Presentation of Past President's Award to John W. James
Presentation of F. Paul Anderson Medal to M. K. Fahnestock

Thursday — February 28

9:00 a.m. REGISTRATION (*Normandy Lounge*)

9:30 a.m. SIXTH SESSION (*Waldorf Room*)
Call to Order — Pres. John W. James
Outlet Characteristics That Affect Downthrow of Heated Air Jets, by Linn Helander, Shee-Mang Yen, and Wilson Tripp
Air Flow in Free Convection over Heated Bodies, by T. F. Hatch and D. Barron-Oronzco
Radioactive Process Ventilation, by S. H. Glassmire, Jr. and J. B. Wahlen
Report of Resolutions Committee
Unfinished Business
New Business
Adjournment

12:00 noon EXPOSITION

1:00 p.m. Organization Meeting of 1957 Council

Journal Section

NOTICE TO ASHAE MEMBERS OF 63rd ANNUAL MEETING, FEBRUARY 25-28, 1957

Please take notice that the 63rd Annual Meeting of the American Society of Heating and Air-Conditioning Engineers, Inc. will take place in Chicago, Ill., in the Waldorf Room of the Conrad Hilton Hotel, at 9:30 a.m., Monday, February 25, 1957.

The meeting will continue through February 28 and will consist of six Technical Sessions at which reports of the Officers and Committees will be given, also 13 technical papers will be presented and two Symposiums are scheduled.

The purpose of the meeting is to elect members of the Council, Officers, Regional Directors, and members of the Committee on Research; to consider reports, to discuss technical papers and to transact such other business as may properly come before the meeting.

The Officers and Council urge your attendance.

John W. James
President

A. V. Hutchinson
Executive Secretary

January 11, 1957

ADVISORY COMMITTEE NAMED FOR EXPOSITION

With the announcement of the Exposition Advisory Committee membership, it was disclosed that the roster of exhibitors will exceed the 450 mark. As heretofore, the Exposition is being held under the auspices of the Society and will occupy the International Amphitheatre, Chicago, Ill., February 25 to March 1, 1957, being held at the same time as the 63rd Annual Meeting.

The Advisory Committee is composed of representatives of the Society and includes the heads of 15 closely associated professional an industrial groups.

John W. James, Chicago, president of ASHAE, is chairman of the committee. The following members are representatives of the Society:

P. B. Gordon, first vice president; E. R. Queer, second vice president; C. H. Pesterfield and J. N. Livermore, members of Council; B. H. Jennings and H. A. Lockhart, chairman and vice chairman of Committee on Research; S. R. Lewis, A. C. Willard, John E. Haines and L. N. Hunter, past presidents; H. G. Gragg, president of Illinois Chapter; F. L. Murray, president of Western Michigan Chapter; I. J. Rositer, president of Wisconsin Chapter; P. J. Marschall, general chairman for 63rd Annual Meeting; Also M. W. Bishop, F. K. Hick, M.D., E. N. McDonnell and C. E. Price.

Representing other organizations are the following committee members: L. L. Dollinger, Jr., president, *Air Filter Institute;* R. W. Nelson, president, *Air Moving and Conditioning Association, Inc.;* Benjamin Linsky, president, *Air Pollution Control Association;* C. H. Zachry, president, *American Gas Association;* Leon Chatelain, Jr., president, *The American Institute of Architects;* C. S. Proctor, president, *American Institute of Consulting Engineers;* C. M. Ashley, president, *The American Society of Refrigerating Engineers;* F. W. Earnest, Jr., president, *Anthracite Institute;* J. M. Whalen, president, *Convector Manufacturers Association;* R. E. Ferry, general manager, *The Institute of Boiler and Radiator Manufacturers;* George Hall, president, *Mechanical Contractors Association of America, Inc.;* G. E. Hochstein, president, *Oil-Heat Institute of America, Inc.;* R. A. Locke, president, *Steel Boiler Institute, Inc.;* L. C. Dubs, president, *Stoker Manufacturers Association;* G. L. Jackson, president, *Western Society of Engineers.*

The Exposition is under management of International Exposition Co., 480 Lexington Ave., New York 17, N. Y., with E. K. Stevens as manager.

CARL H. FLINK AND D. C. JARDINE ELECTED TO LIFE MEMBERSHIP

Carl H. Flink, New York, N.Y.—Carl H. Flink is well known to his fellow ASHAE members as technical secretary at Society headquarters since 1943, and secretary of the New York Chapter since 1944. As technical secretary, Mr. Flink has been responsible for the coordination of technical committee work, has assisted in the compilation of codes and standards, and has worked closely with the Guide Committee as editor of the Technical Data Section of The Guide. He has edited 14 issues of The Guide and some 300 Society technical papers.

Carl H. Flink
New York, N.Y.

Mr. Flink is a native of Ironwood, Mich., and a graduate of the University of Michigan, where he received his B.M.E. in 1915 and was elected to Tau Beta Pi, engineering honorary society. Prior to his association with the headquarters staff, he had 27 years of research and product development experience in various divisions of the American Radiator & Standard Sanitary Corp. Positions held were chief engineer, Institute of Thermal Research, Buffalo, N.Y.; assistant director, Gas Utilization Department; and director of research, American Gas Products Corp. During World War I, Mr. Flink served with the Meteorological Division of the U.S. Army Signal Corps.

In addition to membership in the Society since 1923, Mr. Flink has served on many committees of *A.G.A.*, of which he is a member. He is a licensed professional engineer in the state of New York and an active member of the Chester Hill Methodist Church of Mt. Vernon, N.Y. Among his diversified interests are music, camping and wood-working. Two other roles he plays especially well are those of devoted grandfather and Santa Claus.

Douglas C. Jardine, Colorado Springs, Colo.—Douglas C. Jardine, the owner of a contracting business, retired last year from the U.S. Naval Reserve as a rear admiral.

D. C. Jardine
Colorado Springs, Colo.

He was born in Streator, Ill., and attended school in Colorado Springs. In 1906, he started in business as a plumber's apprentice. He did heating contract work and marine engineering, forming his present contracting business in 1921.

Having served in the U.S. Navy on destroyer convoy duty during World War I, he re-entered service in 1941 as commander, Civil Engineer Corps, commanding amphibious assault groups on Omaha Beach, Normandy and in the Philippine Islands and Borneo.

HONORARY MEMBERSHIP FOR DR. A. C. WILLARD

At the October 21, 1956 meeting of the Council in Chicago, the subject of honorary membership for Dr. Arthur Cutts Willard, President Emeritus of the University of Illinois, was proposed*. The following brief statement summarizes some of Dr. Willard's qualifications and attainments.

A. C. WILLARD
Urbana, Ill.

Dr. Willard was born in Washington, D. C., and received his preparatory education in the public schools of the District of Columbia. In 1904, he was graduated from the Massachusetts Institute of Technology and at once began teaching in California. In 1906, he was appointed assistant professor of mechanical engineering at George Washington University. From 1909 to 1913, he was sanitary and heating engineer in the office of the Chief Quartermaster of the Army.

Dr. Willard first became a faculty member at the University of Illinois in 1913 as assistant professor of heating and ventilating. In 1917, he became professor of mechanical engineering and in 1920 was made head of the Department of Heating and Ventilation. He served as acting dean of the College of Engineering from September 1933 to July 1, 1934, at which time he was appointed the seventh president of the University. In 1946 Dr. Willard was made president emeritus of the University.

During the period of his active connection with the University of Illinois, Dr. Willard was always interested in research, especially in the fields of heat transfer, steam flow and warm-air heating. His reputation in heating and ventilating research is world-wide. He was a pioneer in warm-air heating and it is through his untiring efforts that a residence for research purposes was constructed at the University.

Also, throughout his career, Dr. Willard was actively engaged in consulting work in addition to his faculty duties. Well-known among his many contributions in this connection was his work as consultant on ventilation for the Holland Vehicular Tunnel under the Hudson River, which was the first tunnel in the world used for automobiles, and where the carbon monoxide emitted from exhausts posed a difficult problem.

Dr. Willard was also consultant to the U. S. Bureau of Mines, to the Chemical Warfare Service, and to the U. S. Public Health Service in connection with the ventilation of the House and Senate Chambers of the U. S. Capitol. He also was active as a consultant to the Bureau of Subways in Chicago for many years.

Dr. Willard is the author of numerous publications on heating and ventilating, the best known perhaps being the two-volume reference work on the *Mechanical Equipment of Buildings*, in the preparation of which the late L. A. Harding was co-author.

Dr. Willard has been a member of ASHAE for many years, having joined the Society as a member in 1914. In 1928, he was elected president, following service as 1st vice president in 1927 and 2nd vice president in 1926. Dr. Willard was also a member of the Council of the Society from 1925-29.

He was chairman of the Executive and Publication Committees. From 1927 to 1932 he was a member of the Committee on Research and during the years 1931-37 he served as Technical Adviser for Research. His Society activities also included service on many technical committees including the Guide Publication Committee, Committee on Ventilation Standards and the Committee on Code of Minimum Requirements for the Heating and Ventilating of Buildings.

In 1944, Dr. Willard became a Life Member of the Society. In 1945, he was chairman of the Committee on Research Fund Raising. At the 42nd Annual Meeting in January 1936, Dr. Willard was the recipient of the Society's second F. Paul Anderson Award. Dr. Willard is a member of the Advisory Board of the Society and continues to take an active interest in Society affairs.

ASHAE HOMER ADDAMS AWARD TO P. M. CHUNG

Paul M. Chung, a native Korean, and a graduate student at the University of Minnesota, has been selected as the first recipient of the ASHAE-Homer Addams Award. Announcement of the selection of Mr. Chung was made by Pres. John W.

HOOVER RECEIVES MEMBERSHIP CERTIFICATE FROM PRES. JAMES

In his suite at the Waldorf-Astoria Hotel, New York, the Honorable Herbert Hoover receives his Honorary Membership Certificate from ASHAE Pres. John W. James with 1st Vice Pres. P. B. Gordon ready to present Member Hoover with his copy of THE GUIDE of the Society, November 29, 1956

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*The proposal being signed by more than 10 members and meeting the requirements of **Article II**, *Section* 5 of the By-Laws was unanimously passed by the Council as required in **Article II**, *Section* 6. In order to complete the By-Law procedure, members will vote on the proposal at the opening session of the 63rd Annual Meeting of the Society on February 25, 1957 in Chicago.

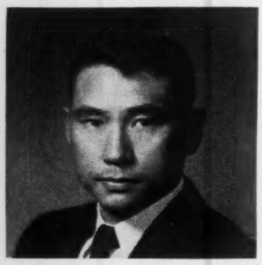
Journal Section

James following the Fall Meeting of Council.

Mr. Chung was born in Seoul where he attended high school and came to the United States in 1947. At that time he attended Asbury College at Wilmore, Ky., majoring in mathematics. In June 1949, he transferred to the College of Engineering at the University of Kentucky in order to major in mechanical engineering. In February 1952, he graduated *with high distinction* from the University of Kentucky receiving a BSME.

Following his graduation, he entered the graduate school at the University of Kentucky majoring in air conditioning and heat transfer. In February 1954, he received the degree MSME from the University of Kentucky with his thesis on the subject, *Performance of University of Kentucky Earth Heat Pump No. 1 Operating Intermittently During the Heating Season of 1952-1953.* In March of 1954, he entered the graduate school of the University of Minnesota, majoring in heating, ventilating, air conditioning and refrigeration. In connection with his work for the PhD degree in the graduate school, he is now working on the thesis, *The Formation of Frost and Heat Transfer Along the Circumference of a Circular Cylinder in a Low Temperature Humid Air Stream Flowing Normal to the Axis of the Cylinder.*

During the Summer periods from 1952 up to 1956, he has performed the duties of Graduate Assistant at the University of Kentucky; has worked for a consulting engineering firm and for a heating and ventilating contractor in Kentucky; has also been a research engineer in the Research Division of the Whirlpool-Seeger Refrigeration Co., and also been active in the Research Division of Minneapolis-Honeywell Regulator Co.



P. M. Chung
Minneapolis, Minn.

Mr. Chung expects to become a naturalized U. S. citizen this year. He is also a member of Tau Beta Pi, Pi Tau Sigma, and associate member of Sigma Xi.

The ASHAE-Homer Addams Award was established by action of Council on April 8, 1956. It takes the form of a suitable scroll together with a sum of money made available to a selected graduate student on a fellowship basis to permit him to conduct research in the field of the arts and sciences of heating, ventilating, cooling and air conditioning.

The Award was made possible by a bequest to the Society by the late Homer Addams, Philadelphia, Pa., who was President of the Society in 1924.

The Award is administered under the jurisdiction of the Honors and Awards Committee, a Special Committee acting under the direction of Council, and whose members are: Prof. E. R. Queer, University Park, Pa., Chairman; John E. Haines, Minneapolis, Minn.; R. A. Sherman, Columbus, Ohio; and Prof. B. H. Jennings, Evanston, Ill.

It is planned that this initial presentation of the Award to Mr. Chung will be made by P. K. Addams, Society member and son of the donor. The presentation will be a feature on the program at the coming 63rd Annual Meeting in Chicago, February 25-28, 1957.

ANNE O'NEIL HONORED FOR 25 YEARS OF SOCIETY SERVICE

A number of years ago a young graduate of a New York secretarial school, filled with the excitement and trepidation of the neophyte, found her way to the headquarters office of the Society and her first job. This proved to be a happy and lasting combination and on November 28, 1956 Miss Anne Marie O'Neil celebrated her twenty-fifth anniversary with ASHAE and was taken to luncheon by her associates. The occasion was recognized by Council at their meeting in October by taking special note of her quarter-century term of service.

Anne O'Neil
New York, N.Y.

Miss O'Neil has given enthusiastic, conscientious, and devoted service to the Society during all of her career. She soon showed an aptitude for publication work and during most of the time she has been engaged in this important branch of the Society's activities. She now works very closely with the editor as his assistant, particularly on publication of the Journal Section, with the title of assistant editor.

With all her office duties, Miss O'Neil also finds time to devote to the Soroptimist International of New York, an association of professional and executive business women, of which she is an interested member.

Twenty-five years is a long time, which is bound to be filled with many memories, and spans the growth of the Society from a membership of approximately 2,200 to almost 11,000. Her work and association with staff members and her friendship with many of the Society members and officers have always meant a great deal to her. Those who work with Anne O'Neil (one 'L', please) know that they can count on her understanding, her true friendship, and her loyalty. With the luck of the Irish, she hopes to be on the job for years to come—a wish that is shared by her associates at ASHAE.

DINNER HONORS WILLARD, KEETON, KRATZ

It is announced that Dr. A. C. Willard, president emeritus of the University of Illinois and past president of the Society, along with R. B. Allen, M.D., Dr. H. H. Mitchell, R. W. Keeton, M.D., and Prof. A. P. Kratz, all former staff members of the University, are to be honored at an informal reception and dinner. This affair is planned for Monday evening, February 25, 1957 at the Conrad-Hilton Hotel in Chicago, thus occurring at the same time of the 63rd Annual Meeting of the Society. Presidential Members, Life Members, and Officers and Council of the Society are invited. It is expected also that many friends of the honored guests and especially alumni of the University of Illinois will be present.

Dr. Willard is internationally known as an outstanding engineer, author, educator and research investigator. He has served the Army Quartermaster Corps, the Bureau of Mines, the Chemical Warfare Service and the Architect of the Capitol as adviser on heating, ventilating and air conditioning problems. As consultant on ventilation for the Holland vehicular tunnel under the Hudson River, he assisted the late Clifford M. Holland, chief engineer. He is also known throughout the world for research in the fields of heating and heat transmission. He is co-author, with the late L. A. Harding, of two volumes on mechanical equipment of buildings, and also authored numerous bulletins, circulars and articles published by the University and in the technical press.

R. W. Keeton, M.D., professor of medicine, emeritus, University of Illinois, and one of the few medical doctors holding membership in the Society, has served on the ASHAE Committee on Research and is presently a member of the Technical Advisory Committee on Physiological Research and the Joint Committee on Comfort Standards. He was the first medical doctor to receive the F. Paul Anderson Medal, awarded to him in 1956. Between 1935 and 1951, Dr. Keeton headed the environmental physiology research work sponsored by the Society and the U. S. Public Health Service at the University's College of Medicine. More than 30 papers on the subject of man's reactions to the effects of his air environment resulted from this work.

A. P. Kratz, research professor of mechanical engineering emeritus, University of Illinois, was a close associate of Dr. Willard's on the Holland tunnel ventilation studies, and the research programs in heating and air conditioning. For years he was in charge of all research in the department of mechanical engineering and for many years he was an active member of ASHAE, serving on the Council, the Committee on Research and as a member of many technical advisory committees.

The dinner and reception are being planned by an informal committee, the members of which include the following Society members: C. M. Burnam, Jr., editorial director, Keeney Publishing Co., Chicago; A. G. Dixon, vice president, Modine Manufacturing Co., Racine, Wis.; M. K. Fahnestock, Department of Mechanical Engineering, University of Illinois, Urbana; R. E. Gould, assistant chief engineer, Frigidaire Division, General Motors Corp., Dayton; E. P. Heckel, consulting engineer, Chicago; Linn Helander, head, Department of Mechanical Engineering, Kansas State College, Manhattan; F. K. Hick, M.D., Department of Medicine, University of Illinois, Chicago; John W. James, president of the Society and vice president, McDonnell & Miller, Inc., Chicago; S. R. Lewis, consulting engineer, Chicago; P. J. Marschall, manager of engineering, Abbott Laboratories, North Chicago; and R. W. Roose, editor, *Heating, Piping & Air Conditioning*, Chicago.

ODOR MEASURING DEVICES

Recently, an Air Pollution Control Conference was held in Cincinnati under the sponsorship of various local organizations including a committee of the *Engineering Society of Cincinnati.*

One of the features of the Conference was descriptions of three types of instruments for measuring odor concentration in air. All of the apparatus makes use of the dilution principle.

One instrument is arranged to draw a sample of 100 cc from a source and then dilute the sample by controlled amounts so that the threshhold concentration can be evaluated. Another of the instruments extracts a liquid sample and various dilutions are made so that the concentration can be determined. The third apparatus obtains a sample of the odorous air and dilutes it by mixing it with filtered clean air.

It is interesting to note that all these equipments depend on the human nose as the sensing unit, since there seems to be no suitable odor-determining equipment which operates without the use of the nose.

LOS ANGELES AIR POLLUTION PAPERS

The Air Pollution Control District of the County of Los Angeles, Calif., has recently completed and published several papers as a result of certain aspects of its work. These include Research Paper No. 10 entitled Studies of Pollution levels in Relation to Air Movements in the Los Angeles Atmosphere, as well as technical papers No. 12 and No. 13. Paper No. 12 deals with visibility studies while paper No. 13 reports on a wind flow study made in the Los Angeles Basin.

FRENCH BOOK ON HEATING

Copies have been received in the headquarters office of a new book written by one of the Society's long-time members, Andre Nessi, who is an engineer of Arts and Manufactures and president of Nessi Bros. & Co., Paris, France.

This book, recently published, although written in French, is nevertheless an interesting piece of work to many of our members.

Calculations of energy required in heating installations in buildings are commonly based on a constant difference between the interior and exterior temperatures and do not take into account the heat capacity of the walls.

Such installations are assumed to operate continuously, but in reality, they frequently function discontinuously with the exterior temperature varying. It is thus necessary to be able to calculate heat capacity as a function of temperature, taking into account the specific heat of the construction materials.

Mr. Nessi's book aims to acquaint technicians with the problems of discontinuous operation and to direct the attention of architects toward a wise choice of materials. It also aims to serve as a practical guide in studies of the functioning of heating with a changing program, and is fully documented.

The following topics are included: (*a*) determination of the variable capacity of an installation functioning on a program of interior temperature and with variations of exterior temperature; (*b*) study of the economics; (*c*) rise of internal temperature with constant steady heating; (*d*) effect of the nature of wall construction on the economy of heating; (*e*) the excess of heating capacity which must be provided in order to meet a given program of interior temperature; (*f*) variable capacity of panels formed with heating tubes incorporated in the masonry.

WINDOWS AND GLASS SESSION AT BRI

Several Society members took an active part in the program of the recent conference on *Windows and Glass in the Exterior of Buildings* conducted by the *Building Research Institute* in Washington.

The program covered two days and was a technical forum to discuss developments in research and design of windows and glass for building exteriors. D. J. Vild, formerly on the staff at the Research Laboratory, summarized the work which has been done at the Laboratory in connection with glass fenestration. R. W. McKinley served as chairman of one of the sessions while E. F. Snyder, Jr. spoke on the subject of *Engineering of Balanced Controls.*

NEW DUTIES FOR DAFTER

It has been announced that E. H. Dafter, Philadelphia, Pa., who has been branch manager of Carrier Corp. Philadelphia office for the past two years, has been appointed assistant regional manager of the Middle Eastern region. He will be in charge of sales activities and personnel in the Philadelphia district and also in charge of district and branch office operations in the region.

ACTIVITIES OF SOCIETY CHAPTERS

Programs held at recent chapter meetings covered a number of subjects of general interest to the membership. Some chapters offered excellent individual speakers, while others presented a panel of experts.

Panel Discussions

Members displayed considerable interest in panel discussions featured at widespread meetings. • • • E. W. Klein, program chairman, ATLANTA Chapter, acted as moderator and posed a list of preselected questions to a panel of contractors. Those taking part in the program were Stanley Florsheim, Delta Heating Co.; Charles Sockwell, Jr., president, Sockwell Co.; Robert Sasser, Sasser & Co.; Fred Horne, Horne Plumbing Co.; A. C. Gowdy, vice president, Huffman-Wolfe Co. of Atlanta; and G. B. Hightower, president, Conditioned Air Engineers, Inc., Atlanta, Ga. The audience had an opportunity to query the panel members at the end of the presentation. • • • *An Architect's and Engineer's Views of an Ideal Mechanical Contractor* were offered by a panel of speakers at an ONTARIO Chapter meeting. M. C. Bailey was the moderator of a panel consisting of H. F. Brown, Mathers & Haldenby, and P. M. Keenleyside, Govan, Ferguson, Lindsay, Kaminker, Langley & Keenleyside, representing the architects; J. H. Ross and W. H. Bonus, each a consulting engineer; plus 2 speakers for the contractor, R. A. Ritchie, manager, John Ritchie Ltd., and W. A. Mould, director and secretary-treasurer, English & Mould Ltd., Toronto, Ontario, Canada. A lengthy discussion period followed the stimulating talks. • • • H. L. Wray of

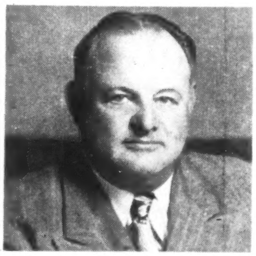
Journal Section

ROCKY MOUNTAIN Chapter played the middleman between sheet metal contractors and mechanical engineers, moderating the views of 4 panel members. Representing the sheet metal contractors were S. E. Fox, partner, Sam Fox Sheet Metal Co., and John Cypra, Cypra Heating & Air Conditioning Co. A word for the engineers was given by Earl Hickman, Thermal Engineering Co., and Ruper Fooks, Fooks Engineering Co. The speakers stressed the need for preconstruction conferences attended by all the contractors, engineers and architects to avoid later changes in plans, and lengthily treated the matter of balancing the air distribution system. After the panel discussion, questions entertained from the floor were satisfactorily answered by either the moderator or panel members.

Speakers

Varied topics were covered by those invited to speak at chapter meetings held recently throughout the United States and Canada. • • • An exceedingly interesting talk on *Solar Energy*, its availability and application, was made by J. I. Yellott, secretary-treasurer, *Association for Applied Solar Energy*, Phoenix, Ariz.. who is also assistant director, Stanford Research Institute. Mr. Yellott presented a moving picture produced in Russia, showing considerable study of the application of solar energy to industrial and commercial as well as domestic requirements. • • • A program in 3 parts was given to the AUSTIN Chapter. Firstly, Art Cunningham, of the Austin Public Schools, gave statistics on the rapid growth of the Austin school system. The second phase was a talk by Hugh Green, Television Department, University of Texas, on experiments and research relating to audio-visual education. In conclusion, Jim Osborne, American Air Filter Co., Inc., Louisville, Ky., discussed the part of the Austin school year requiring heating and ventilation. • • • Two speakers graced the BATON ROUGE platform. Nels Lunda and Ed Desforges gave a discussion, demonstration, and slide film program on insulation. • • • BLUEGRASS Chapter members heard Frank Carter, Detroit Division, American Radiator & Standard Sanitary Corp., give a complete coverage of auto air-conditioning controls. • • • Guest speaker John DeForest, Canadian Pacific Airlines, described in detail the special equipment used in the heating and air conditioning of various types of aircraft. His BRITISH COLUMBIA audience also heard Mr. DeForest outline the controls used in aircraft. • • • A fine presentation on the heat pump was made at a CENTRAL OHIO Chapter meeting by John Hensel and John Condrieth, Ohio Power Co., and Ralph Kramer, consulting engineer, Kramer, Kohmer and Passe. • • • At another meeting of the same chapter, *Codes* was the featured topic. The speakers were R. S. Curl, consulting engineer, Robert S. Curl & Associates; B. W. Cornelius, partner and mechanical engineer, Sims, Cornelius & Schooley; and T. R. Walker, vice president, Columbus Heating & Ventilating Co., Columbus, Ohio. • • • A dissertation on high velocity duct distribution presented before the DELTA Chapter proved to be very informative. M. W. Kennedy, manager, Air Distribution Development, Barber-Colman Co., Rockford, Ill., gave the presentation. • • • An illustrated talk on heat pumps was given by W. H. Miehe, specialist in engineering administration, Air-Conditioning Section, General Electric Co., Bloomfield, N.J., before an EMPIRE STATE CAPITAL Chapter audience. • • • Speaker of the evening for a GOLDEN GATE meeting was G. F. Carlson, engineer, Bell & Gossett Co., Morton Grove, Ill. Mr. Carlson discussed *Design Checks for Forced Hot Water Heating Systems*, and with a model pump he demonstrated the effects of the location of the expansion tank within the system. A lively question and answer period followed his talk. • • • An INDIANA Chapter coffee speaker, Robert Leech, State Board of Health, treated the *Minimum Standard in the Design of Heating, Ventilating and Air-Conditioning Systems.* C. H. Pesterfield, professor of mechanical engineering, Michigan State University, East Lansing, Mich., gave the main presentation on *Firm Specifications of Commercial and Industrial Oils for Oil Burners.* Professor Pesterfield, who is a member of Council and regional director of Region 2, also discussed Society operations. • • • Another member of Council, A. J. Hess, who is regional director of Region 4, and president, Hess, Greiner & Polland, Los Angeles, was guest speaker at an INLAND EMPIRE meeting. An interesting part of his talk on *Trends in Refrigeration and Air Conditioning* concerned the effects of air conditioning on plants and animals, their growth and reproduction. • • • A program on hot water heating given by IOWA Chapter featured 3 speakers: D. E. Wells, president, Products, Inc.: E. M. Bartels, supervisor of mechanical equipment, Independent School District: and R. H. Schnell, chief draftsman, Paul A. Walters, consulting engineers; all of Des Moines, Ia. • • • John E. Haines, past president of the Society, spoke briefly at a KANSAS Chapter meeting. He defined air conditioning and explained how it increases production in industry. The main topic of the evening, *Evaluation of Water-Saving Equipment*, was covered by James McKim, Salina Supply Co. Mr. McKim discussed the initial and operation costs of air-conditioning systems using towers, evaporative condensers, water cooled condensers and air cooled condensers. • • • Past President Haines also made a short talk in KANSAS CITY, urging promotion of the Society's accomplishments. The presentation of the evening was given by C. N. Kimball, president, Midwest Research Institute, Mr. Kimball spoke on the growth of Kansas City as a center of science, and told of the great need for commercial and industrial business in both large cities and small towns. • • • *Pipe Fabrication* was the subject selected by MANITOBA Chapter guest speaker R. E. Reese, assistant works manager, Page-Hersey Tubes Ltd., Toronto, Ont. Mr. Reese made the trip especially to address the meeting. He placed particular emphasis on larger sizes of pipe, the 16-36 in. range which is much needed for transcontinental gas lines. • • • A thought-provoking talk on *Specification Writing* was delivered before MINNESOTA Chapter by K. M. Wilson, chief engineer, E. F. Klinger & Associates, Eau Claire, Wis. • • • The aims of the Better Business Bureau were described in a coverage of *Business Frauds* by J. J. Henry, manager, Better Business Bureau, Omaha, Nebr. Mr. Henry gave the members of the NEBRASKA Chapter examples of untruthful advertisements. • • • J. W. May, technical director, Air Filter Division, American Air Filter Co., Inc., Louisville, Ky., outlined in detail the factors to be considered in the

C. H. Pesterfield
East Lansing, Mich.



A. J. Hess
Los Angeles, Calif.

Attention!!
Members of ASHAE
Moved or Moving?

Each month mail is returned BECAUSE you overlooked advising us of the change in your address.

The return mail is a loss to you, and an added expense to the Society.

In your own interest, will you please advise us at once of any change in your business or home address, indicating which is your mailing address.

ASHAE Headquarters
62 Worth St.
New York 13, N. Y.

Sacramento Valley "Slide Rule Golf Tournament" winners receive their trophies. *(L. to R.)* E. J. Varvello, chairman, ASHAE Tournament Committee, congratulates Fred Brooks, architect, winner of the Guests' Trophy, as J. A. White, winner of the Members' Trophy is congratulated by Pres. V. W. Thornburg of the Sacramento Valley Chapter, who sponsored the tournament. It is planned to make this an annual event to which all engineer and architect golfers will be invited.

Selection and Application of Air Filters. This excellent presentation of filter facts was well received by his NEW MEXICO Chapter audience. • • • R. E. Burke, a member of NEW YORK Chapter and manager, sales department steam service operations, Consolidated Edison Company of New York, spoke before an audience of fellow members, *ASRE* members and other guests. Mr. Burke treated the *Development of Purchased Steam for Refrigeration Cycle in Air Conditioning in New York City.* Following the presentation, the speaker answered many questions from the audience. • • • NORTHERN OHIO Chapter programmed a talk by Wilson Hunter, assistant to the director, National Advisory Committee for Aeronautics. Mr. Hunter discussed the creation of artificial environment for testing flight conditions, and showed slides of various jet engines, which demonstrated their air consumption and methods of testing. A lively question and answer period concluded the program. • • • OKLAHOMA Chapter was briefed on the Regional Plan and its relation to chapter operations by D. M. Mills, regional director, Region 6. • • • S. W. Little thoroughly covered his subject, *Collaborative Professions,* in an address given at an OREGON Chapter meeting. Dean Little stressed the importance of teamwork among the architect, engineer, material producers and contractors. His talk was enjoyed by all present. • • • Members of the OTTAWA VALLEY Chapter took interest in a discussion on *Ducting as Applied to Air Handling* by their guest speaker, H. S. Fowler, Division of Mechanical Engineering, National Research Council. Points covered in the speech were later emphasized by slide projects. • • • Many years experience with problems affecting operation of hot water heating systems gave weight to a talk by H. A. Lockhart, vice president of engineering, Bell & Gossett Co., Morton Grove, Ill. Mr. Lockhart's topic was *Point of Zero Pressure Change in Forced Hot Water Heating System,* presented at another meeting of the Ottawa Valley Chapter. • • • E. H. Kessler, state senator, informed PHILADELPHIA Chapter members on *Present-day Labor Relations and Their Impact on Industry.* • • • *Refrigeration Problems and Their Solutions* were posed by R. L. Scafe, manager, service department, The Trane Co., La Crosse, Wis., at a SOUTH TEXAS meeting. He emphasized the importance of well-balanced system components and proper refrigeration piping. • • • TOLEDO Chapter heard H. E. Voegeli, development engineer, The American Brass Co., Waterbury, Conn., speak on *Stored Solar Heat and The Heat Pump.* Mr. Voegeli traced the development of systems using either the sun or the earth for heating or for heat pumps, and commented on the experimental work being done to improve heat pump installations and their effectiveness. Audience response to a request for questions at the end of the talk was considerable. • • • Pointing out the many pitfalls in the mis-application of automatic controls, L. F. Flagg, supervisor of commercial field training, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., spoke to the WASHINGTON, D. C. Chapter on *Design Coordination.* He supported his presentation with an excellant selection of slides. Mr. Flagg's discussion was accepted with much enthusiasm by all members and visitors. • • • The editor and publisher of *Air Conditioning & Refrigeration News,* G. F. Taubeneck, of Detroit, Mich., told the WESTERN NEW YORK Chapter *What's Wrong with Air Conditioning.* Mr. Taubeneck predicted the growth of residential, window and automotive air conditioning by 1960. Emphasis was placed on the lack of engineers to take care of this growth.

Wisconsin Chapter Scholarship Now Official

On October 21 the Council of ASHAE voted formal approval and recognition of the Wisconsin Chapter's Gustus L. Larson Award Committee. By this action the committee becomes an official Society Committee.

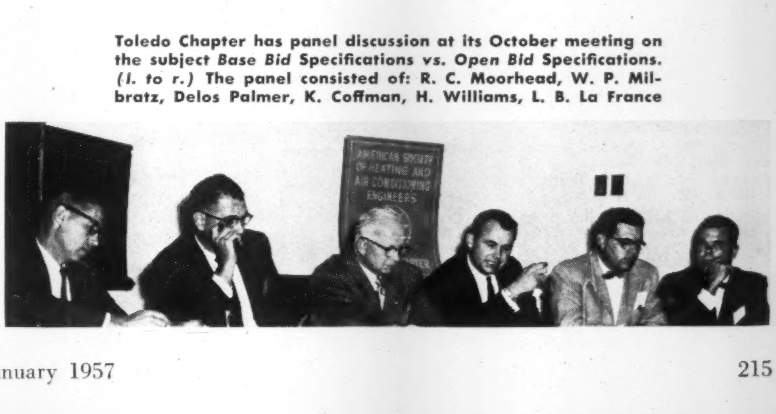
Gustus L. Larson, now deceased, was president of the Society in 1936. He was also chairman of the Mechanical Engineering Department of the University of Wisconsin. As an officer of the Society and an educator he contributed greatly to our profession; not alone of his knowledge but more importantly by inspiring many of our present-day industry leaders to seek their fame in this field.

In recognition of Professor Larson's example the Wisconsin Chapter began several years ago to plan a memorial in his name. This eventually took the form of a fund for outstanding students studying in the field of heating, ventilating and air conditioning to be known as the G. L. Larson Award. Final plans, including articles of organization and by-laws, were completed this spring and presented to the Society's Council for review and approval.

The first award was made to Ronald L. Kausch, senior in mechanical engineering at the University of Wisconsin, on November 15, 1956, at a joint dinner meeting of the Rock River Valley Section of the *ASME* and the University of Wisconsin Student Section, *ASME.* The award was presented by J. A. Lofte, past president, Wisconsin Chapter of ASHAE.

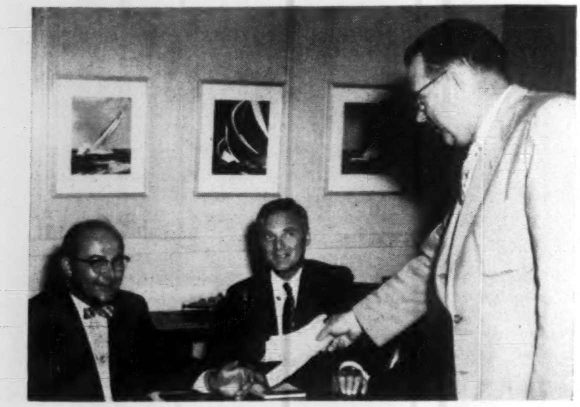
The award will be a cash amount designed to offset some of the student's expenses for books and tuition. Contributions to a capital fund are now being solicited and will be solicited in the months to come from manufacturers and interested individuals. Earnings from the capital fund will determine the number and extent of the award. Junior and senior undergraduates and graduates will be eligible.

Toledo Chapter has panel discussion at its October meeting on the subject *Base Bid* Specifications vs. *Open Bid* Specifications. *(l. to r.)* The panel consisted of: R. C. Moorhead, W. P. Milbratz, Delos Palmer, K. Coffman, H. Williams, L. B. La France


AMERICAN SOCIETY OF HEATING AND AIR CONDITIONING ENGINEERS

Journal Section

Wisconsin Chapter, ASHAE, receives first checks for Gustus L. Larson Fund. *(l. to r.)* B. M. Kluge, secretary, P. D. Gayman, co-chairman, and L. C. Plaehn, chairman, all of Milwaukee, accepting the first donations to the Fund Other members on the Gustus L. Larson Award Committee are Bert Fredericksen, F. W. Goldsmith, F. J. Nunlist, Jr., I. J. Rossiter



To date a total of nearly $3000.00 has been received by the committee from Johnson Service Co., from other firms and from several members of the Wisconsin Chapter. Now that Council approval of the award has been made it is planned to expand the fund by calling the attention of additional companies to it beyond the four companies already contacted.

All contributions are net to the principal of the fund. Operating expenses will be absorbed by the Wisconsin Chapter.

CANDIDATES FOR MEMBERSHIP

Listed here are the names of 92 men who are candidates for membership or advancement in membership grade.

Members are requested to assume their full share of responsibility of receiving these candidates into membership by advising the Executive Secretary before January 31, 1957, of any whose eligibility for membership is questioned. Unless such objection is made these candidates will be voted upon by the Council.

Note: Advancement* Reinstatement†

Arizona *(Region 4)*

GROTHEY, F. R., Mfrs. Repr., Phoenix.

HOAGLUND, J. B.*, Sales Engr., Carns-Hoaglund Sales Co., Phoenix.

Arkansas *(Region 6)*

HERRING, H. D., Jr. Engr., Turner-McCoy, Inc., North Little Rock.

HUGHES, MAURY, JR.*, Exec. Vice-Pres., Landauer and Shafer, Little Rock.

California *(Region 4)*

ANDERSON, G. M., Gen. Mgr., A-C. & Refrig. Div., Fluor Products Co., Whittier.

BAMFORD, J. V., Partner, Stockly and Bamford, Cons. Engrs., Los Angeles.

HARDEMAN, C. S., Pres., C. S. Hardeman, Inc., San Francisco.

HOLTZ, G. R., Sales Mgr., Farr Co., Los Angeles.

LEMANSKI, E. L., Design Engr., Stockly and Bamford, Cons. Engrs., Los Angeles.

LONG, L. E., Sales Engr., Wagner Electric Corp., El Segundo.

SACKETT, D. M.*, Owner, D. M. Sackett & Assoc., Los Angeles.

STOCKLY, W. H., Partner, Stockly and Bamford, Cons. Engrs., Los Angeles.

WENZELL, H. J., A-C. Design Engr., M. K. Shields & Co., Los Angeles.

ZABLODIL, R. J., Dir., Heat & Sanitation Dept., Naval Research & Evaluations Laboratory, Port Hueneme.

Colorado *(Region 3)*

BARSCH, W. J.*, Repr., Crane Co., Denver.

Illinois *(Region 2)*

AVERY, R. F., Sales Engr., R. Cooper Jr., Inc., Peoria.

CHARLET, L. W.†, Mgr., Sales Engineering Dept., Kewanee Boiler Div., American-Standard, Kewanee.

DROBNY, S. G., Sales Engr., American Air Filter Co. Inc., Herman Nelson Div., Moline.

PALMER, L. M., Mgr., Htg. & A-C. Div., The Field and Short Co., Decatur.

PARTSCH, G. G., Dist. Repr., Worthington Corp., Peoria.

REDD, W. C., JR., Staff Engineer, Caterpillar Tractor Co., Peoria.

REOCK, J. H., Sales Promotion Mgr., Keeney Publishing Co., Chicago.

SCHWAB, C. S., Sales Engr., Barber-Colman Co., Rockford.

THVEDT, J. A., Corresponding Engr. & Export Mgr., McDonnell & Miller, Inc., Chicago.

Indiana *(Region 2)*

HAWKINS, J. M., Engr., Walter Scholer and Assoc., Archts., Lafayette.

Iowa *(Region 3)*

CUMMINGS, A. J., Owner, Cummings Plumbing & Heating Co., Clinton.

RYERSON, H. E.†, Supvsr., Indus. & A-C Sales, Iowa-Illinois Gas Co., Davenport.

WELLS, R. A., Pres., Wells Sales Co., Des Moines.

Kansas *(Region 3)*

MAYABB, J. C., Repr., National-U.S. Radiator Corp., Wichita.

PEUGH, R. B., Engr., E. E. Hysom & Assoc., Wichita.

Louisiana *(Region 5)*

FALLER, H. E.*, Assoc., A. R. Salzer, Jr. & Assocs., New Orleans.

GWIN, C. L., Mech. Engr., Harold L. Flettrich, New Orleans.

HEBERT, J. I., JR., Partner, C. W. Mackie Co., New Orleans.

HEINISCH, J. E.*, Owner, Air Conduit Co., Lake Charles.

SALZER, A. R., JR.*, Owner, A. R. Salzer, Jr. & Assocs., New Orleans.

Louisiana *(Region 6)*

JUNEAU, C. J., A-C., Htg., Mech. Refrig. & Vtg. Inspector, City of Shreveport, Shreveport.

Maryland *(Region 5)*

HEWITT, F. M.*, Partner, Taze & Hewitt, Baltimore.

STUCKI, A. C.*, Plant Engr., Applied Physics Lab., The Johns Hopkins University, Silver Spring.

Massachusetts *(Region 1)*

BREEN, H. P., JR., Designer, Buerkel & Co., Inc., South Boston.

FORD, G. E., JR., Sales Engr., Worthington Corp., Springfield.

Michigan *(Region 2)*

BECKERT, B. A., Assoc., Beckert Co., Saginaw.

JONES, W. L., Sales Estimator, George W. Akers Co., Ferndale.

MASON, L. B., JR.*, Partner, Air Engineering Co., Kalamazoo.

STEFFEN, J. F., JR., Mech. Estimator, William A. Adam Co., Detroit.

Mississippi *(Region 5)*

ALLEN, H. T., Sales Engr., F. J. Evans Engineering Co., Jackson.

Missouri *(Region 3)*

BARE, R. W., Engr., R. P. Stahl, Archt., Springfield.

BROOKS, C. C., Partner, Toensfeldt & Horch, Cons. Engrs., St. Louis.

EDWARDS, D. F., JR., Engr., D. F. Edwards Heating Co., St. Louis.

FRANK, L. H., Asst. Engr., Burns & McConnell Engineering Co., Kansas City.

GEBHARDT, P. W., Sales Engr., E. K. Campbell Co., Kansas City.

JOHNS, J. P., Sales Engr., Siemon Manufacturing Co., Grandview.

MANN, J. D., Sales Engr., Chas. D. Jones & Co., Kansas City.

Nebraska *(Region 3)*

LATENSER, J. S., Mech. Engr., John Latenser & Sons, Archts.-Engrs., Omaha.

New Jersey *(Region 1)*

MCCUAIG, D. H., Mgr.-Sales Appl. Engr., Worthington Corp., East Orange.

RAMSEY, M. A., Chief Engr. Applied Systems, A-C. & Refrig., Worthington Corp., East Orange.

New Mexico *(Region 6)*

MCCORD, W. C., Owner-Mgr., Mountain States Insulation Co., Albuquerque.

MORRIS, E. F., Chief Engr., Edward T. Kryfko, Cons. Engr., Albuquerque.

New York *(Region 1)*

COLLINS, P. A., Vice-Pres., Almirall & Co., Inc., New York.

GALAZZI, W. S., Dist. Engr., York Corp., New York.

Ohio *(Region 2)*

ENGLISH, M. L., Assoc. Prof. Mech. Engrg., University of Cincinnati, Cincinnati.

PETERSON, W. A., Engr.-Partner, Baker Furnace Co., Toledo.

WEBBER, R. R., Sales Engr., F. K. Minor Co., Cleveland.

WILSON, ROBERT, JR., Br. Mgr., John J. Nesbitt, Inc., Dayton.

Oregon *(Region 4)*

AUSTILL, R. J., Asst. Engr., Balzhiser Engineer-

Pennsylvania *(Region 1)*

COPELAND, J. E., Sales Engr., Delaware Valley-York, Inc., Philadelphia.

NOBLE, T. S., Pres., Delaware Valley-York, Inc., Philadelphia.

SPREENBERG, R. F., Purchasing Agent, Limbach Co., Pittsburgh.

YOUTZ, J. A., Sales Engr., John J. Nesbitt, Inc., Philadelphia.

Tennessee *(Region 5)*

HORNADY, D. C., Technician, Johnson Service Co., Nashville.

Mann, C. F., Repr., Crane Co., Memphis.
Woodbury, R. S., Secy. & Treas., T. J. O'Brien, Engineering Co., Memphis.

Texas *(Region 6)*

Byl, Cornelius, Chief Engr., Providence Memorial Hospital, El Paso.
O'Brien, H. L., Partner, Marshall-O'Brien Assocs., Dallas.
Perez, F. G., Engrg. Asst., Monroe Licht & Higgins, El Paso.
Phelan, C. M.†, Proj. Engr., Cosden Petroleum Corp., Big Spring.
Sartor, T. F.*, Cons. Engr., Lubbock.

Washington *(Region 4)*

McLean, L. E., Sales Engr., Diesel Oil Sales Co., Seattle.

Wisconsin *(Region 2)*

Breitzman, R. J., Engr., E. F. Klinger & Assocs., Inc., Eau Claire.

Wyoming *(Region 3)*

Harms, Carl, Retired, Cheyenne.

Canada *(Region 7)*

Berryman, E. J., Mgr., Plbg. & Htg. Dept., Crane, Ltd., Quebec, Que.
Carter, G. B., Control Engr., Canadian Comstock Co., Ltd., Montreal, Que.
Dorion, Raymond, Secy.-Treas. & Estimator, J. Dorion, Inc., Quebec, Que.
Glover, A. L., Dealer Mgr., Carrier Engineering, Ltd., Toronto, Ont.
Hoegenwarth, H. J., Design Draftsman, D. W. Thomson, Cons. Mech. Engr., Vancouver, B.C.
Horvath, Eugene*, Pres., Canadian Mechanical Trades, Ltd., Toronto, Ont.
Kaye, K. W., Engr., Engrg. Dept., Sheldons Engineering, Ltd., Galt, Ont.
Keen, J. N., Sales Engr., Carrier Engineering, Ltd., Toronto, Ont.
Leiterman, Alan, Sales Engr., Honeywell Controls, Ltd., Winnipeg, Man.
McCourtney, E. G., Br. Mgr., Wells H. Morton & Co., Ltd., Edmonton, Alta.
Racine, R. W., Htg. Sales Engr., B. C. Electric Co., Ltd., Vancouver, B. C.
Ross, T. F., Sales Engr., Trane Co. of Canada, Ltd., Vancouver, B. C.
Saillant, Maurice, Pres.-Owner, Saillant, Inc., Quebec, Que.
Shipley, G. R., Engr., Lockerbie & Hole Western Ltd., Edmonton, Alta.
Springstein, C. E., Estimator-Plbg. & Htg., Waterman-Waterbury Co., Ltd., Winnipeg, Man.

OBITUARIES

IN MEMORIAM

Ernest Szekely
1888-1956

Ernest Szekely, president of the Society in 1952 and president of Bayley Blower Co., Milwaukee, Wis., died at his home in Wauwatosa on Thursday, November 29, 1956, after a prolonged illness.

Born July 24, 1888 in Debrecen, Hungary, and graduated from the University of Budapest in 1910 with an M.E. degree, Mr. Szekely began his engineering career as assistant and later became associate professor at the University.

After coming to the United States, he worked as a designer for Guarantee Construction Co., New York, and as a research engineer for American Blower Co. He had a consulting engineering office in Cleveland for many years, specializing in public buildings and schools. Later, he became chief engineer for Drying Systems, Chicago, and then chief engineer for Bayley Blower. The climax of his career came in 1932 when he was named Bayley's president.

Mr. Szekely, who joined the Society in 1920 and became a Life Member in 1954, was extremely active in both the Northern Ohio and Wisconsin Chapters, as well as in Society activities. He served as a member of the Council, 1945-47, and on numerous Society committees, including the Nominating Committee and the Code Committee for Exhaust Systems. In 1949, he was treasurer of the Society and a member of the Finance Committee of the Council, and in 1950 was chairman of the Finance Committee. The following year he became first vice president and chairman of both the Executive and the F. Paul Anderson Committees.

In 1952 Mr. Szekely served as Council chairman, and in 1953 as a member of Council and chairman of its Executive Committee, as well as chairman of the Advisory Board. Since 1954 he was a member of the Advisory Board.

In addition, Mr. Szekely served on many Technical Advisory Committees, including the TAC on Infiltration in Buildings; the TAC on Effect of Entering Temperature and Velocity on the Temperature and Distribution of Air Within an Enclosure, serving as its chairman in 1936; and the TAC on Air Distribution, 1937 to 1950, serving as its chairman in 1937.

Mr. Szekely served the Northern Ohio Chapter as vice president in 1923 and president in 1924, and the Wisconsin Chapter as second vice president in 1933, first vice president in 1934 and president in 1935. From 1936 to 1938 he was a member of the board of governors of the Wisconsin Chapter and also had served on many of the chapter's code and other committees.

Mr. Szekely wrote numerous engineering articles and is listed in *Who's Who in Engineering*. He was a member of the *ASME*, the *Wisconsin Society of Professional Engineers*, the *Astronomical Society*, and president of the *Engineers Society of Milwaukee* 1946-47. He also held membership in Rotary International, Tau Beta Pi and Pi Tau Sigma, and Marquette University faculty. He was a Presbyter in the Evangelical Reformed Church, and director of Town Hall of Milwaukee.

Mr. Szekely was an accomplished musician and had travelled widely. He had a host of friends who enjoyed his fine sense of humor. Many of the Council Meetings were enlivened by his witty observations.

He is survived by his wife, Sari, his son George E. Szekely, and two grandchildren. Funeral services were held at the Ritter Funeral on Monday, December 3, at 2:00 p.m.

RALPH S. FRANKLIN
Boston, Mass.

A Life Member of the Society, Ralph S. Franklin, mechanical engineer, Lockwood Greene Engineers, Inc., Boston, Mass.,

died suddenly on October 25. Mr. Franklin reached the age of 76 last May. He was vice chairman of the Society's Committee on Research in 1930 and served the Massachusetts Chapter as president in 1934.

Mr. Franklin, who studied at Massachusetts Institute of Technology, acted as president of Albert B. Franklin, Inc., Boston, for a number of years. His design projects include the heating and ventilating plants for the Soldiers & Sailors Memorial Building, Melrose, Mass.; Somerville Theatre & Office Building, Somerville, Mass., and Gedik Pasha School, Istanbul, Turkey.

He made his home in Melrose.

LYNN H. JACKETT
Cleveland, Ohio.

Lynn H. Jackett, a member of the Society since 1946, died in Cleveland, Ohio, on October 11 at the age of 44. He had been in ill health for some time.

Head of the mechanical department of McGeorge-Hargett & Associates in Cleveland at the time of his death, Mr. Jackett had been connected with that company since 1942. He was active in community affairs, serving on the council of suburban Lyndhurst, Ohio. Also interested in landscape architecture, he had been president of the Cleveland chapter of the *American Society of Landscape Architects.*

Surviving are his wife, Honoria; a daughter, Gay; a son, Gary; and his mother, Mrs. Effie Jackett.

ELMER S. JAGGARS
El Paso, Tex.

Elmer S. Jaggars, 48, sales engineer, Boyd Engineering Co., Inc., El Paso, Tex., died on October 5. Mr. Jaggars had been associated with Boyd Engineering since 1952.

In earlier years he was a teacher at El Paso Technical Institute, 1939-40, and for 11 years following he was owner-manager of Jaggars Engineering.

Mr. Jaggars is survived by his wife.

AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS

REGIONAL DIRECTORS

Chairman: E. R. Queer

Region 1	John Everetts, Jr.
Region 2	C. H. Pesterfield
Region 3	John E. Haines
Region 4	A. J. Hess
Region 5	C. B. Gamble
Region 6	D. M. Mills
Region 7	J. H. Fox

Program Subcommittee†: A. J. Hess, Chairman, 1706 S. Main St., Los Angeles 15; D. L. Angus, 25 Bayview Wood, Toronto, Ont., Canada; W. P. Chapman, 3816 N. 40th St., Milwaukee 16; L. F. Christofferson, 425-1411 Fourth Ave. Bldg., Seattle 1; C. W. DeLand, 6138 N. Clark St., Chicago 26; B. L. Evans, 4030 Chouteau (Rm. 212) St. Louis 10; C. B. Gamble, 635 Commercial Pl., New Orleans 12; A. S. Gates, Jr., Dept. of Navy, Bureau of Ships, Washington 25; J. B. Graham, 490 Broadway, Buffalo 5; Linn Helander, Dept. of Mechanical Engrg., Kansas State College, Manhattan, Kans.; Fred Janssen, 1123 W. Third Ave., Denver; G. A. Linskie, 2608-A Inwood Rd., Dallas 19; P. J. Marschall, 14th & Sheridan, No. Chicago; W. O. Stewart, 615 N. Alvarado St., Los Angeles 26; H. E. Ziel, 345 New Center Bldg., Detroit.

GENERAL COMMITTEES

Admission and Advancement: C. S. Koehler, Chairman (one year); F. H. Buzzard (two years); Roswell Farnham (three years).

Publication: G. B. Priester, Chairman (one year); W. J. Collins (two years); J. W. May (three years).

Guide: M. W. Keyes, Chairman; H. W. Alyea, W. P. Chapman, R. C. Chewning, J. R. Duncan, R. A. Gonzalez, N. B. Hutcheon, R. L Maher, D. W. Nelson, B. H. Jennings (Ex Officio).

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NORTH CAROLINA

Northern Piedmont: 1952. Hdqrs., Greensboro, Meets, 2nd or 3rd Fri. PRES, L. R. Gorrell, 1412 Chester Rd., Raleigh. SECY, C. E. Amick, 1042 Oakmont Ave.

Southern Piedmont: 1952. Hdqrs., Charlotte. PRES, J. A. Rice, 719 E. Worthington Ave. SECY, E. D. Streng, P.O. Box 4083.

OHIO

Central Ohio: 1944. Hdqrs., Columbus. Meets, 3rd Mon. PRES, W. A. Schoonover, 2901 N. High St. (2). SECY, R. C. Liebert, 623 N. High St. (11).

Cincinnati: 1932. Hdqrs., Cincinnati. Meets, 1st Tues. PRES, R. G. Anderson, 1758 Elmore St. (23). SECY, C. P. Krantz, 2308 W. 8th St. (4).

Miami Valley: 1950. Hdqrs., Dayton. Meets, 1st Wed. PRES, J. B. Rishel, 397 W. 1st St. (2). SECY, R. B. Walcott, 2340 E. River Rd. (9).

Northern Ohio: 1916. Hdqrs., Cleveland. Meets, 2nd Mon. PRES, H. R. Canoyer, 1900 Superior. SECY, R. D. Wilson, 2142 E. 19th St. (15).

Toledo: 1954. Hdqrs., Toledo. PRES, J. F. Guest, 1815 N. 13th St. SECY, Robert Greenwald, 2525 Portsmouth Ave. (13).

OKLAHOMA

Oklahoma: 1935. Hdqrs., Oklahoma City. Meets, 2nd Mon. PRES, F. R. Denham, 320 Oklahoma Natural Bldg. (2). SECY, W. R. Johnson, 120 E. Main.

Northeastern Oklahoma: 1948. Hdqrs., Tulsa. Meets, 2nd Tues. PRES, H. W. Meinholtz, Box 2261. SECY, H. L. Cauvel, 3342 East 41st St.

OREGON

Oregon: 1939. Hdqrs., Portland. Meets, Thurs. after 1st Tues. PRES, W. R. Norte, 2225 N. E. Broadway (12). SECY, G. G. Van Alst, 947 S. E. Market.

PENNSYLVANIA

Philadelphia: 1916. Hdqrs., Philadelphia. Meets, 2nd Thurs. PRES, C. J. Lubking, 3345 W. Hunting Park Ave. (32). SECY, Ludwig Mack, 412 W. Hortter St. (19).

Pittsburgh: 1919. Hdqrs., Pittsburgh. Meets, 3rd Mon. PRES, R. M. Toucey, 223 Fourth Ave. (22). SECY, G. E. Smetak, 1238 Brighton Rd. (23).

SOUTH CAROLINA

South Carolina: 1954. Hdqrs., Columbia. PRES, J. E. McMurray, 1639 Blanding St. SECY, A. L. Blackstone, Jr., 1630 Laurel St.

TENNESSEE

Memphis: 1944. Hdqrs., Memphis. Meets, 3rd Mon. PRES, W. L. Henson, 496 S. Main St. SECY, G. B. Ramsey, Jr., 157 Neil St. (3).

TEXAS

Austin: 1956. Hdqrs., Austin. PRES, B. E. Segall, Jr., 705 N. Lamar. SECY, J. L. Rea Jr., 300 W. 8th St., P.O. Box 5206.

El Paso: 1956. Hdqrs., El Paso. PRES, J. O. LeBeau, Jr., 1021½ E. Missouri. SECY, J. H. Brooks, 4028 Hamilton St.

North Texas: 1938. Hdqrs., Dallas. Meets, 3rd Mon. PRES, H. G. Gregerson, 4512 Livingston (5). SECY, Ross Zumwalt, 929 Mercantile Securities Bldg. (1).

South Texas: 1938. Hdqrs., Houston. Meets, 3rd Fri. PRES, J. C. Lewis, Box 8188. SECY, E. B. Appling, 4101 San Jacinto St. (4).

Southwest Texas: 1946. Hdqrs., San Antonio. Meets 3rd Tues. PRES, Boone Crisp, Rt. 2, Box 421. SECY, D. T. Kern, 14 Chandler Bldg. (5).

West Texas: 1953. Hdqrs., Lubbock. Meets, 1st Tues. PRES, J. C. Wharton, P. O. Box 1240. SECY, D. G. Halley, 3608 Ave. A.

UTAH

Utah: 1944. Hdqrs., Salt Lake City. Meets, 3rd Thurs. PRES, W. L. Stuewe, 1472 S. State St. (4). SECY, W. C. Leslie, 307 W. 2nd St.

VIRGINIA

Virginia: 1946. Hdqrs., Norfolk. Meets, 3rd Wed. PRES, C. G. Conaway, Jr., 7454 Hank Ave. (5). SECY, E. R. Simpson, Jr., 720 Guy St.

WASHINGTON

Inland Empire: 1950. Hdqrs., Spokane. Meets, 1st Mon. PRES, Max Tonn, 4021 S. Latawah. SECY, R. D. Nevers, E. 124 Augusta, P.O. Box 5026 (21).

Pacific Northwest: 1928. Hdqrs., Seattle. Meets, 2nd Tues. PRES, L. F. Christofferson, 425-1411 Fourth Ave. Bldg. (1). SECY, H. M. Hendrickson, Mech. Engrg. Dept., University of Washington (5).

WISCONSIN

Wisconsin: 1922. Hdqrs., Milwaukee. Meets, 3rd Mon. PRES, H. K. Forfar, 1400 E. Park Pl. (11). SECY, H. W. Snyder, 5520 W. Burleigh.

CANADA

British Columbia: 1952. Hdqrs., Vancouver. Meets, 2nd Wed. PRES, D. W. Thomson, 1690 W. Broadway (9). SECY, W. F. Keenan, 54 W. Fifth Ave. (10).

Chapitre de la Ville de Quebec: 1956. Quebec City. PRES. Jean Veilleux, 350 E. Charest Blvd. SECY. R. A. Harnois, 604 St. John St., Rm. 203.

Manitoba: 1935. Hdqrs., Winnipeg. Meets, 4th Thurs. PRES, A. H. Millar, 342 Mandeville St. (12). SECY, R. M. Fraser, 1855 Sargent Ave. (12).

Montreal: 1936. Hdqrs., Montreal. Meets, 3rd Mon. PRES, S. R. Plamondon, City Planning Dept., Smoke Control Division, City Hall. SECY, Arthur DeBreyne, 9 St. Denis St., St. Lambert.

Northern Alberta: 1956. Hdqrs., Edmonton. Meets, 3rd Wed. PRES, W. C. Woods, 13908 116 Ave. SECY, E. K. Cumming, 10249 104 St.

Ontario: 1922. Hdqrs., Toronto. Meets, 1st Mon. PRES, C. J. Bootes, 15 Torbarrie Rd., Downsview. SECY, H. R. Roth, Rm. 407, 57 Bloor St., W.

Ottawa Valley: 1952. Hdqrs., Ottawa. Meets. 3rd Tues. PRES, D. W. Banton, 360 Richmond Rd. (3). SECY, Jacob Klassen, 454 Slater St.

SPECIAL BRANCH

Switzerland: 1952. Hdqrs., Zurich. PRES, Walter Hausler, Erbstrasse 2, Kusnacht. SECY, L. F. de Bruyn, Heschgasse 45.

STUDENT BRANCHES

North Carolina State College: 1948. Faculty Adviser: Prof. R. B. Knight, M. E. Dept., Raleigh, N. C.

Oregon State College: 1949. Faculty Adviser: Prof. G. E. Thornburgh, M. E. Dept., Corvallis, Ore.

Purdue University: 1948. Faculty Adviser: Prof. F. B. Morse, M. E. Dept., West Lafayette, Ind.

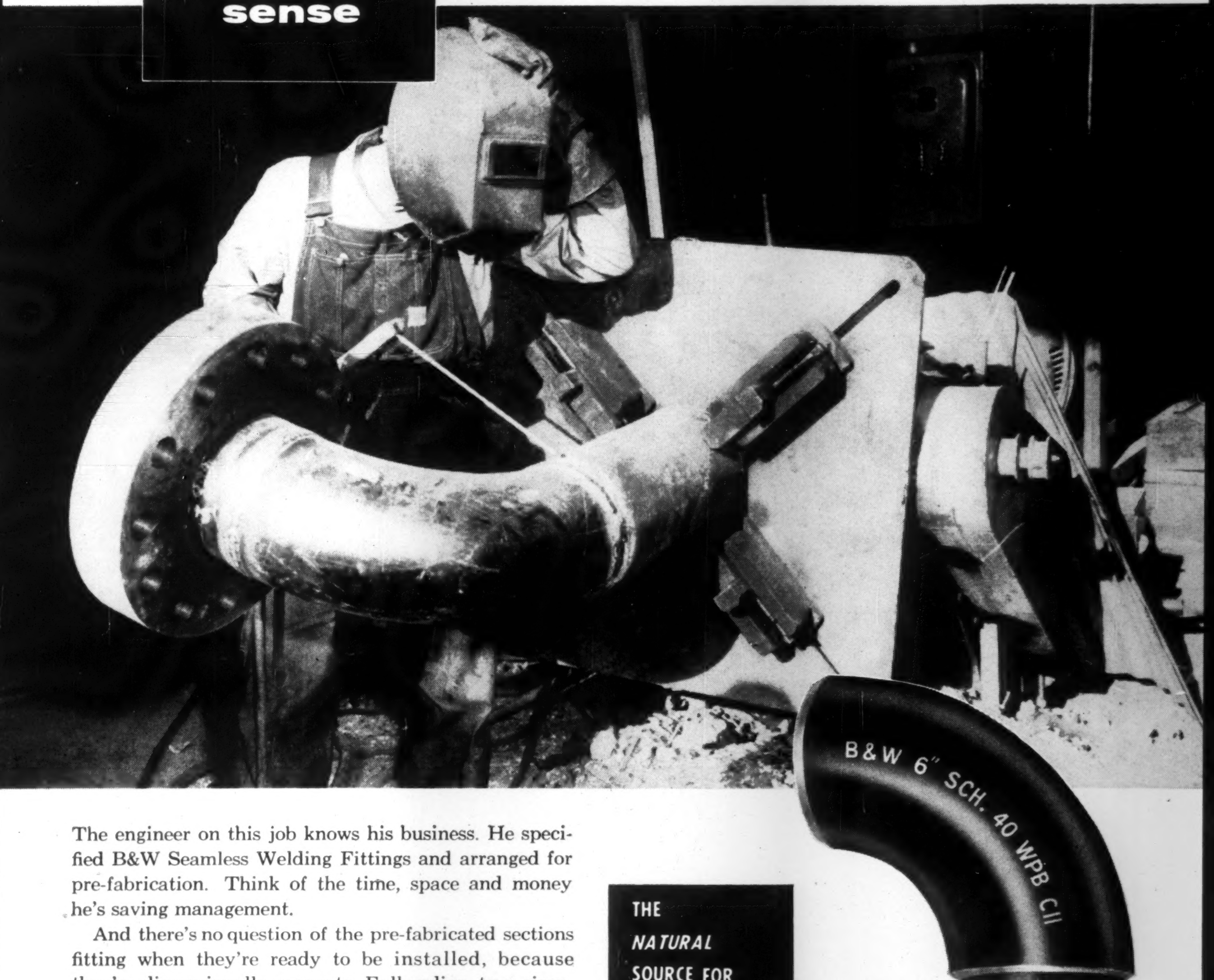
Texas A. & M. College: 1946. Faculty Adviser: Prof. L. S. O'Bannon, M. E. Dept., College Station, Tex.

University of Detroit: 1949. Faculty Adviser: Prof. J. E. Lay, M. E. Dept., Detroit, Mich.

University of Toronto: 1951. Faculty Adviser: Prof. F. G. Ewens, M. E. Dept., Toronto, Ont., Canada.

result of an engineer's good common sense

Pre-fabrication saves time, space and money when B&W Seamless Welding Fittings are used!



The engineer on this job knows his business. He specified B&W Seamless Welding Fittings and arranged for pre-fabrication. Think of the time, space and money he's saving management.

And there's no question of the pre-fabricated sections fitting when they're ready to be installed, because they're dimensionally accurate. Full radius, true circularity and smooth walls of exact thickness permit fast alignment and easy fit-up.

This time, specify B&W Seamless Welding Fittings for a permanent, leakproof piping system. Seamless Welding Fittings allow piping to nest closer, are stronger, yet weigh considerably less than other types of fittings. They're available in a complete range of sizes and types in carbon and the B&W Croloys.

THE *NATURAL* SOURCE FOR ALLOY FITTINGS

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Seamless welding fittings and forged steel flanges, seamless and welded tubular products — in carbon, alloy and stainless steels.

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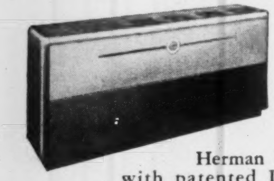
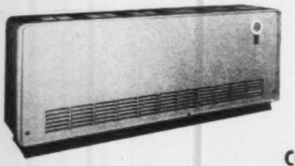
HERMAN NELSON UNIT VENTILATORS GIVE MORE CLASSROOM COMFORT PER DOLLAR



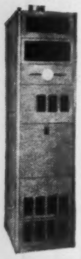
HOT WATER OR STEAM

Herman Nelson Unit Ventilators with patented DRAFT|STOP control downdrafts without adding to the heat load, provide ideal classroom climates.



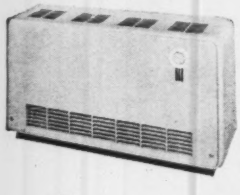
AIR CONDITIONING

The HerNel-Cool unit provides mechanical cooling, heating, ventilating or natural cooling as required. Thoroughly tested in hot, humid climates.



GAS

New UNIvent Gas School Ventilator provides all the health and comfort features of the DRAFT|STOP system in a completely self-contained unit.



MILD CLIMATES

AMERVENT built especially for schools in mild climate areas, provides fresh air cooling, heating and ventilating within the nominal cost of heating alone.

ELECTRIC

New Electric Unit Ventilator in which an electric heating element replaces the hot water or steam coil provides all DRAFT|STOP comfort features.

Herman Nelson now offers a line from which you can select the ideal unit for meeting any school's requirements! The cooling, heating, ventilating system can be "tailored" to provide true classroom comfort in the most economical and most practical way.

VARIETY OF FUELS

In temperate or cold climates, the *Herman Nelson Unit Ventilator* operates with either *hot water, steam, gas* or *electricity.* The patented DRAFT|STOP system has given a new meaning to "classroom comfort" as it controls down drafts and automatically provides a constant supply of properly heated or cool fresh air.

AIR CONDITIONING

HerNel-Cool units offer an economical and practical solution to the increasingly important air conditioning problem. Most of the year they provide heat, ventilation or natural cooling (with outside air). Air conditioning can be provided at any time by simply adding a chiller to the system. The units switch automatically to mechanical cooling with chilled water circulating in the same piping that carries hot water during cold weather.

MILD CLIMATES

Schools in mild climates have an increased cooling and ventilating problem and a decreased heating problem. With Herman Nelson *AMERVENT* these schools can now enjoy all the essentials for classroom comfort—cooling, heating and ventilating—without paying for the excess heating capacity required in frigid climates.

* * *

Flexibility will always be important to Herman Nelson—for there is no "one best" system to provide for heating, ventilating and cooling classrooms. The health and comfort of pupils and teachers come first. Climate area, design and structure of each school will indicate the most economical and practical system to achieve that ideal classroom atmosphere.

Would you like more information? Ask your Herman Nelson representative or write to Herman Nelson Products, American Air Filter Company, Inc., Louisville 8, Kentucky.

BETTER AIR IS OUR BUSINESS

AAF
herman nelson
UNIT VENTILATOR PRODUCTS

American Air Filter Company, Inc.
System of Classroom Cooling, Heating and Ventilating

"DOMESTIC" VACUUM PUMPS

FOUNDED 1903

A UNIT ENGINEERED FOR EVERY REQUIREMENT

Domestic efficient Multi-Jet Vacuum Producer assures greater system performance.

Vacuum Producer's original efficiency retained for years because it has no moving parts to wear or score.

Quicker system warm-up saves fuel.

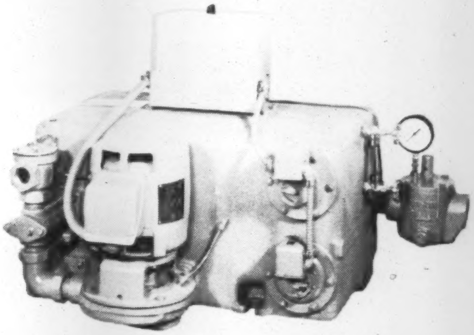
Lifetime cast iron receivers and unusually low inlets on all Domestic production models.

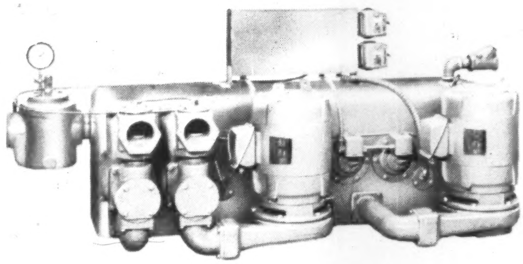
Vertical mounting protects motors and saves space.

Package unit . . . factory assembly includes internal wiring of control equipment—eliminating hidden costs.

TYPE VLR VACUUM PUMP

Especially designed for modern finned tube radiation and other systems having low cubic content. Single and duplex units, up to 20,000 sq. ft. EDR and up to 75 psi discharge pressure. Available in both standard and special capacities.



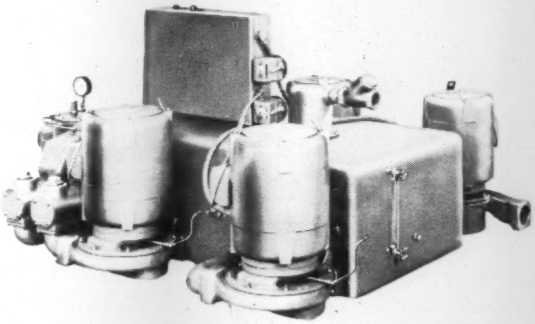


TYPE VL VACUUM PUMP

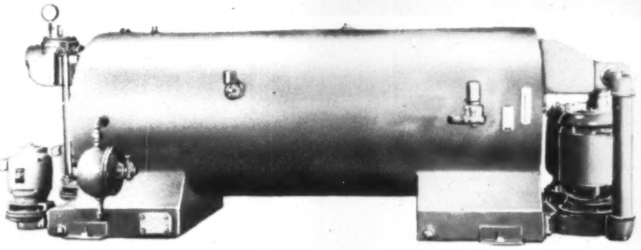
Ideally suited for sprawling installations and long returns. Single and duplex units, 25,000 to 100,000 sq. ft. EDR and up to 60 psi discharge pressure . . . both standard and special capacities.

TYPE VCA VACUUM PUMP

Individually sized and separately controlled vacuum and condensate pumps provide maximum flexibility while materially reducing power costs. Especially suited for differential heating systems as well as industrial process service. Single, duplex and semi-duplex units, up to 90 CFM at 20" Hg vacuum and up to 200 GPM and 75 psi discharge pressure. Duplex units provide double capacity.



CUSTOM VACUUM PUMPS TO MEET YOUR DEMANDS



TYPE VCM VACUUM PUMP

Custom designed for each application. Automatic water make-up. Pumps are individually sized and controlled for maximum flexibility and economy. Available with one, two or four vacuum pumps each rated up to 95 CFM at 20" Hg and one to four boiler feed pumps, each rated up to 400 GPM and up to 75 psi discharge pressure.

DOMESTIC PUMP & MANUFACTURING CORP. • SHIPPENSBURG, PA.

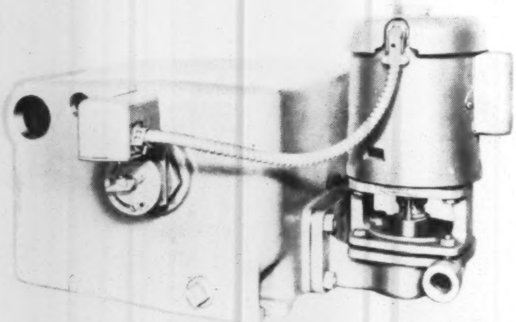
"DOMESTIC" CONDENSATION PUMPS

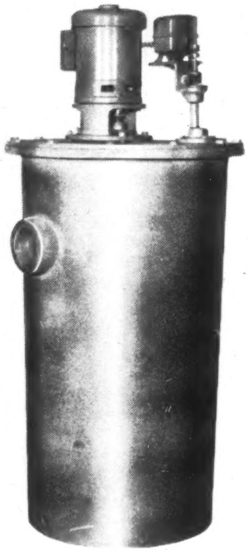
FOUNDED 1903

DOMESTIC DEPENDABILITY BUILT INTO EVERY UNIT

TYPE SC CONDAFLO UNITS

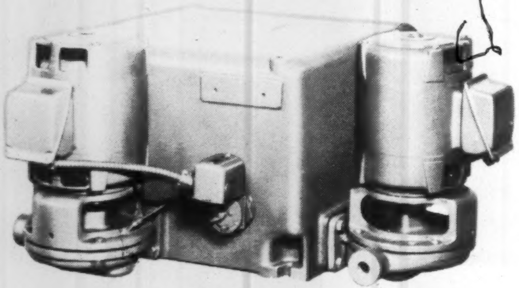
An exceptionally reliable, low cost condensation pump with top quality pump motor and controls. Lifetime cast iron receiver with low inlet. Capacities up to 8,000 EDR at 20 psi discharge pressure. Single and duplex units.





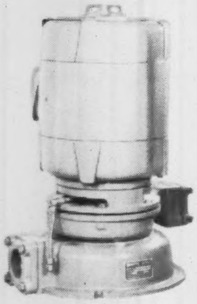
TYPE CU UNDERGROUND UNITS

The Underground condensate pump is used where the returns are located either too low for a standard pump or below the floor. Close grained cast iron receiver gives lifetime service. Capacities up to 40,000 sq. ft. EDR and up to 60 psi discharge pressure.



TYPE CC CONDENSATION UNITS

A compact dependable condensation pump with motor vertically mounted away from dirt and water. Low inlet receiver of lifetime cast iron. Capacities up to 150,000 EDR and discharge pressures up to 75 psi. Single, duplex and water make-up units.

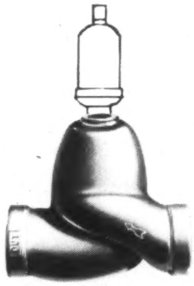


GENERAL PURPOSE CLOSE COUPLED CENTRIFUGAL PUMPS

Vertical base mounted pump shown, flange mounted and horizontal models also available.

DOMESTIC CENTRIVENT AIR ELIMINATOR

Effective air separation assures top performance of a water system and reduces noise caused by air.



DOMESTIC PUMP & MANUFACTURING CORP. • SHIPPENSBURG, PA.

Inside Story on POWELL GATE VALVES

Gate Valves may appear similar on the outside. But their performance may be quite another story -- for there can be a big difference in the metal, in design and in manufacture. And the inside story on Powell Gate Valves is that every valve has PERFORMANCE VERIFIED.

Only the finest materials are used in Powell Gate Valves. And painstaking quality control is rigidly enforced through each step of manufacture. For example, every machining operation is accurately gauged. All parts are thoroughly cleaned and degreased. As a final step in manufacture, EVERY POWELL GATE VALVE IS GIVEN AN ACTUAL LINE TEST.

Because of Powell's painstaking quality control, plant shutdown through valve failure is practically unknown. Records from refineries, power and industrial plants the world over prove it.

Consult your Powell Valve distributor. If none is near you, we'll be pleased to tell you about our COMPLETE quality line which has PERFORMANCE VERIFIED.

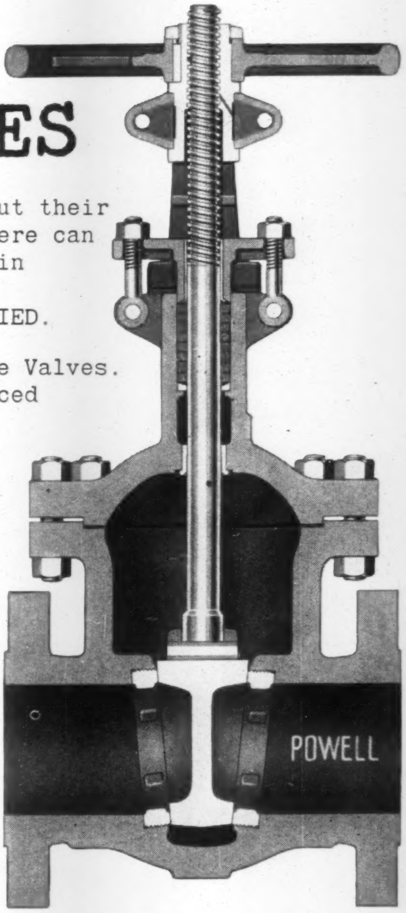


FIG. 3003 (Sectional) Steel Gate Valve for 300 Pounds W.S.P.

FIG. 500 -- Bronze Screwed-in Bonnet Gate Valve for 125 Pounds W.S.P.

200 WOG
MS
POWELL
125
WSP

FIG. 1793 -- Iron Body Bronze Mounted "Model Star" Gate Valve for 125 Pounds W.S.P.

PERFORMANCE
PV
VERIFIED

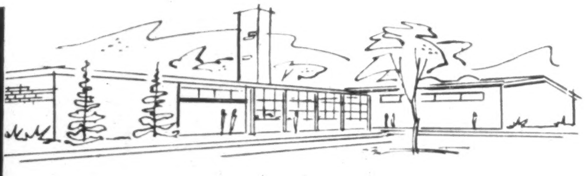
The Wm. Powell Company, Cincinnati 22, Ohio . . . 111th YEAR

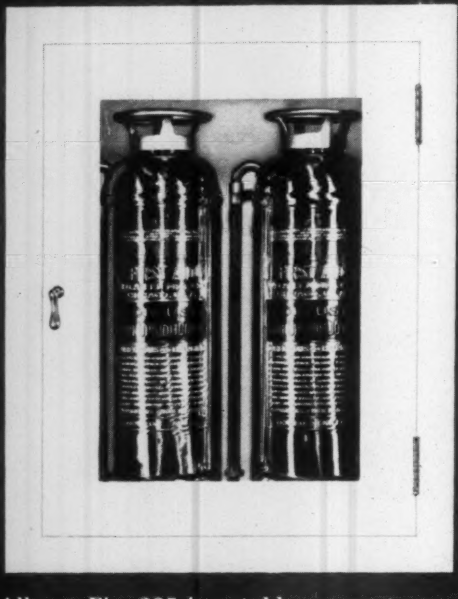
POWELL VALVES

BRONZE, IRON, STEEL AND CORROSION RESISTANT VALVES

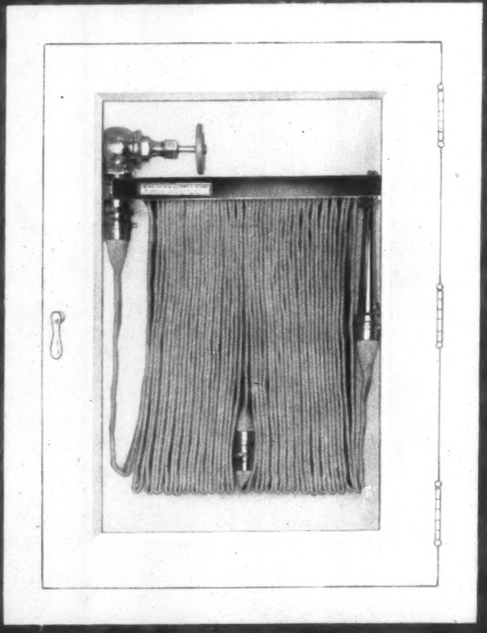
For Interior Fire Protection in
SCHOOLS and CHURCHES . . .

Of the many distinct ALLENCO *models, these two are most popular for installations in this field.*





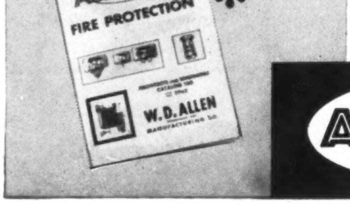
Allenco Fig. 285 is notably compact, contains one or two fire extinguishers and, if specified, tamperproof door.



Allenco Fig. 262 is "custom-sized" to suit choice of 5 hose-lengths, 4 hose-sizes with plain or fog nozzles, with optional spanner and bracket, and space limitations of any application-point.

Cabinets of both units are available in several groups—Allenco Satin Finish Hollow Steel Door, Nella Sheet Steel Door, Aluminum Doors, and other styles. Rigid and true-to-size, they go in faster . . . look better . . . serve perfectly.

Catalog 150
(A.I.A. file 29e2)
contains full details in
simplest form, including standard
quotable specifications.
Write for your copy now . . .



ALLENCO

Architects, Engineers and Contractors prefer

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Here are a few recently completed installations:

*ALLENCO

Where	What	Specifier	Installer	Fieldman
Springfield, Mass.	Junior High School	Maloney & Tessier	A. E. Stephens Co.	Harold Jope
West Hartford, Conn.	Junior High School	Nichols & Butterfield	Wadhams & May Co.	Harold Jope
Cincinnati, Ohio	Washington Park Elem. School	A. M. Kinney	B. A. Walterman Co.	Dick Disney
Ann Arbor, Mich.	University of Mich. Library	Albert Kahn Assoc.	Dunbar-Borton	Russ Collins
Portland, Ore.	Woodrow Wilson High School	Tom E. Taylor	A. G. Rushlight Co.	Dick Finklea
Salem, Ore.	South Salem High School	Tom E. Taylor	Vern Collins Plbg. Co.	Dick Finklea
Salt Lake City, Utah	Latter-Day Saints Church	Owner	Owner	Nic Nicodemus
New Orleans, La.	St. Martin's School	James M. Todd & Assoc.	Frank A. Dorsa	Bob Barnes
Pullman, Wash.	Women's Residence, W. S. C.	James B. Natkin	Senna Service, Inc.	Stan Schafer
Moscow, Idaho	University of Idaho Library	Whitehouse, Price, DeNeff & Geeble	Detweiler Bros.	Stan Schafer
Minneapolis, Minn.	Zion Lutheran Church	Thorsov & Cerney, Inc.	Dean L. Witcher, Inc.	Art Narverud
St. Louis Park, Minn.	Cathedral High School	Louis C. Pinault	Roel Construction Co.	Art Narverud
LaFayette, Ind.	Purdue University Dorms	Walter Scholer	Freyn Bros.	Don Davisson
Bloomington, Ind.	I. U. Medical Science Building	Ammerman, Davis & Stout	Hayes Bros.	Don Davisson
Fairview Park, Ohio	High School	Fulton, Krinsky & DelaMotte	Gorman-Lavelle P & H	Jerry Sullivan
Gates Mills, Ohio	St. Francis of Assisi Church	Horn & Rinehart, Archs. P. B. Fleming, C. Engr.	Gorman-Lavelle P & H	Jerry Sullivan
Pittsburgh, Pa.	High School	Celli & Flinn	John Kennelly	Wm. Negle

Harold Jope

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Dick Finklea

Nic Nicodemus

Bob Barnes

Stan Schafer

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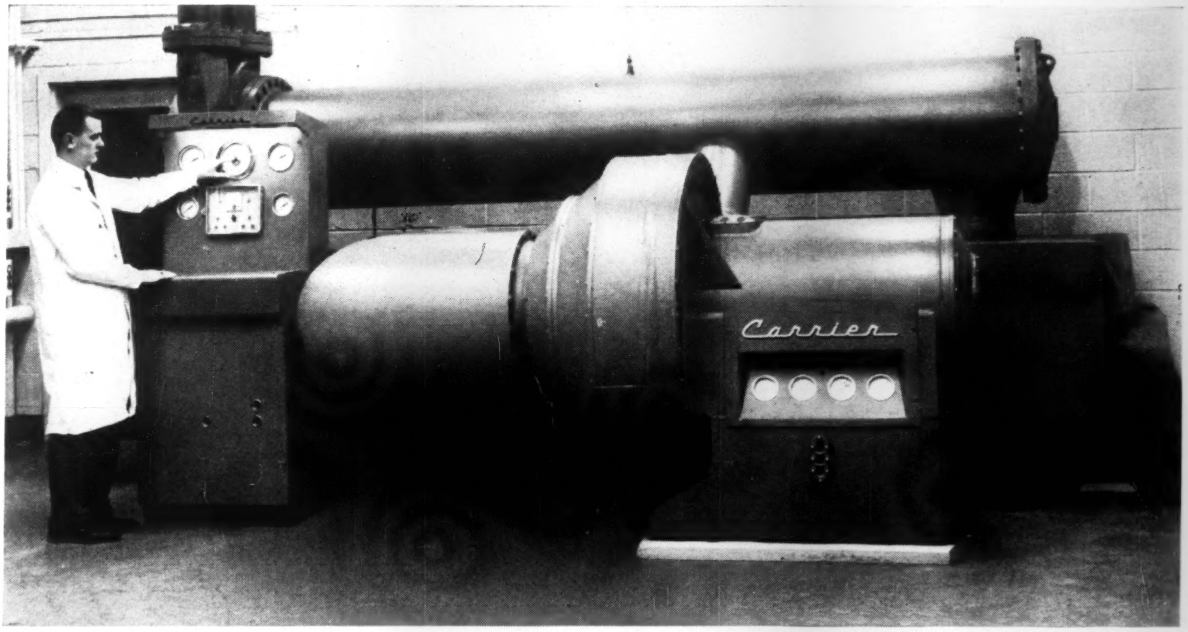
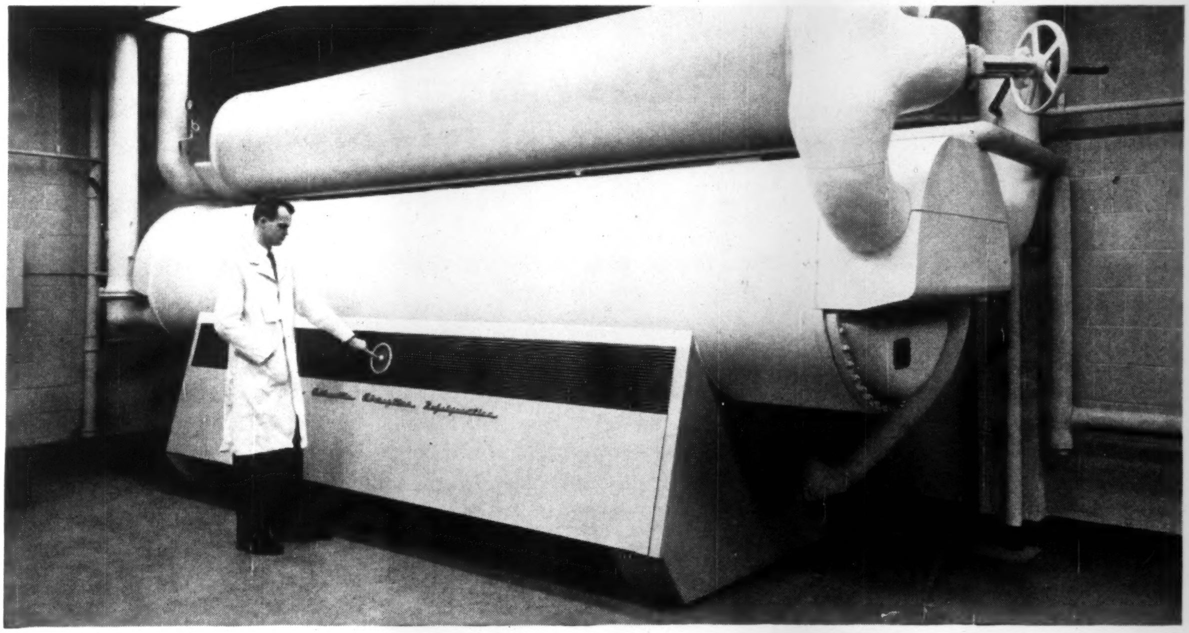
Which way is best to air condition a building?

Every building poses different problems. Take the refrigerating machine, for instance. Where should it be located? What kind of energy is available? What are the capacity requirements of the building? Only Carrier gives you a choice of these two refrigerating machines. Which is best? Each provides unique advantages under special conditions. For complete information about them, call your nearest Carrier office. Or write Carrier Corporation, Syracuse, New York.

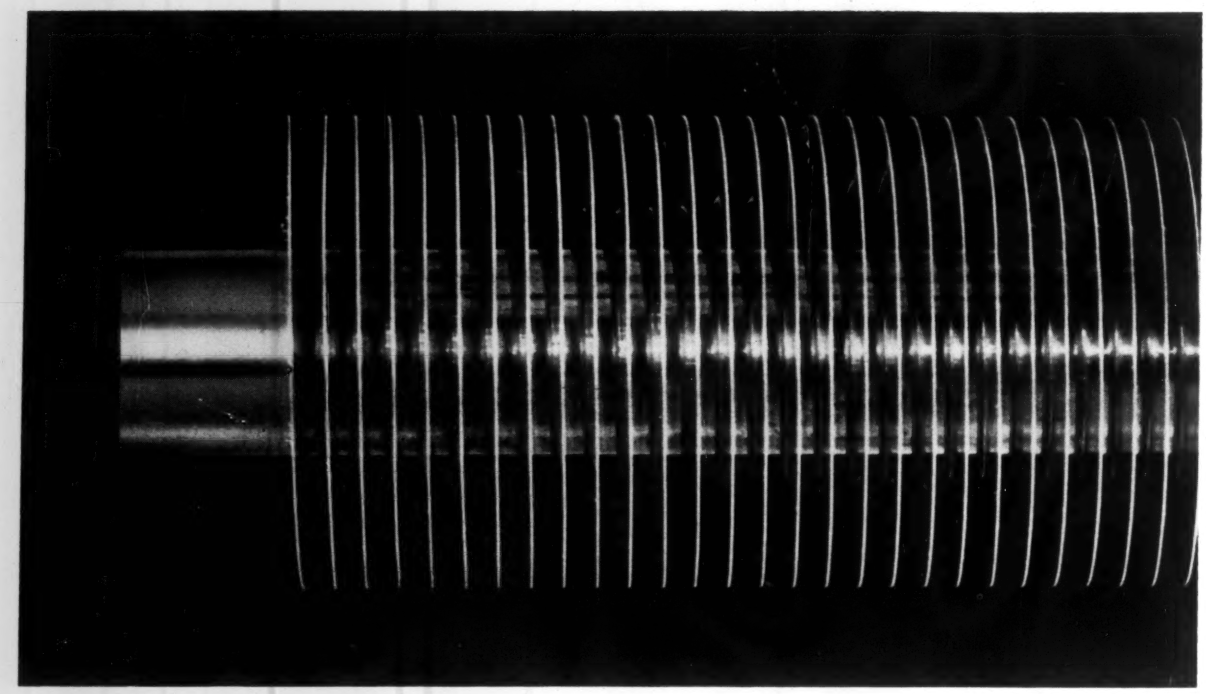
Carrier



If you have low-cost power, the new Carrier Hermetic Centrifugal Refrigerating Machine offers unmatched advantages. It's the only hermetic with such advanced features as a refrigerant-cooled motor, hydraulic powered capacity vanes, and electronic controls for completely automatic operation. Its compact design and light weight minimize space and structural requirements. Capacities from 90 to 1000 tons. Other Carrier Centrifugal Refrigerating Machines up to 4000 tons. For smaller buildings, there are "packaged" Carrier Reciprocating Water Cooling Machines ranging from 3 to 200 tons.



If you have low-cost steam, the best way may be a new Carrier Absorption Refrigerating Machine. It cools with heat energy derived from low-pressure waste steam or hot liquids to cut costs. Operates automatically at the push of a button. Follows fluctuating loads electronically from full load to zero capacity. It's safe—with water the refrigerant, a simple salt the absorbent. And it's so compact and vibration-free you can locate it wherever there's space to spare—on the roof, in the basement or anywhere in between. Cooling capacities in this new Carrier line range from 60 to 700 tons.



AEROFIN

Smooth-Fin Coils offer you

Greater Heat Transfer
per sq. ft. of face area

Lower Airway Resistance
—less power per c.f.m.

Aerofin smooth fins can be spaced as closely as 14 per inch with low air friction. Consequently, the heat-exchange capacity per square foot of face area is extremely high, and the use of high air velocities entirely practical. Tapered fin construction provides ample tube-contact surface so that the entire fin becomes effective transfer surface. Standardized encased units arranged for simple, quick, economical installation.

Greater Capacity
Less Air Resistance
with AEROFIN
Heating and Cooling Coils

Write for Bulletin S-55

AEROFIN CORPORATION

101 Greenway Ave., Syracuse 3, N. Y.

Aerofin is sold only by manufacturers of fan system apparatus.
List on request.

TRI-SUL-ITE
ZCO

PERMANENT WATER BARRIER

for hot underground pipes

Anyone can install Tri-sul-ite. It is supplied in 100 lb. black and silver bags and merely poured around the pipes in the ditch, tamped and cured.

TRI-SUL-ITE

3-WAY PROTECTION SYSTEM

(formerly INSUL-ITE)

WHAT DOES TRI-SUL-ITE DO?

Tri-sul-ite is a specially selected and granulated gilsonite. After being poured and tamped around the pipes, it forms, by proper curing, 3 *permanent* zones for protecting against water, corrosion and underground heat loss. The first zone adjacent to the pipe fuses, from pipe heat, into an impermeable, water- and corrosion-proof coating. The second zone of partially fused material has excellent insulating properties. The third zone of unfused Tri-sul-ite granules provides maximum insulating efficiency plus unusually high resistance to water penetration.

Tri-sul-ite comes in three types:

Type 1 for pipe temperature range between 220°F. and 300°F.

Type 2 for temperature range between 300°F. and 385°F.

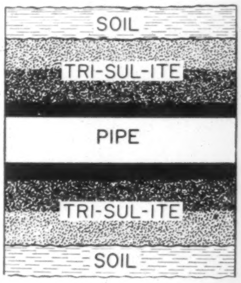
Type 3 for temperature range between 385°F. and 520°F.

OTHER SPECIAL ADVANTAGES

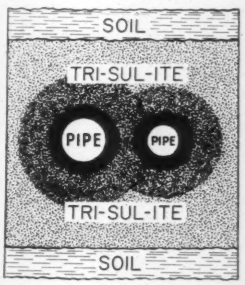
- No extra housing required. Tri-sul-ite forms its own protective covering.
- Only normal pipe spacing is needed. Ells, loops and multiple pipe lines present no difficulty whatsoever.
- When you use Tri-sul-ite you obtain expert field service and installation guidance by qualified engineers.

- Water cannot follow the grade of the pipe
- Prevents corrosion
- Excellent insulating value
- Very low material and installation costs
- Speediest, simplest installation
- Eliminates maintenance
- Easily adaptable to future pipe changes

SIDE VIEW



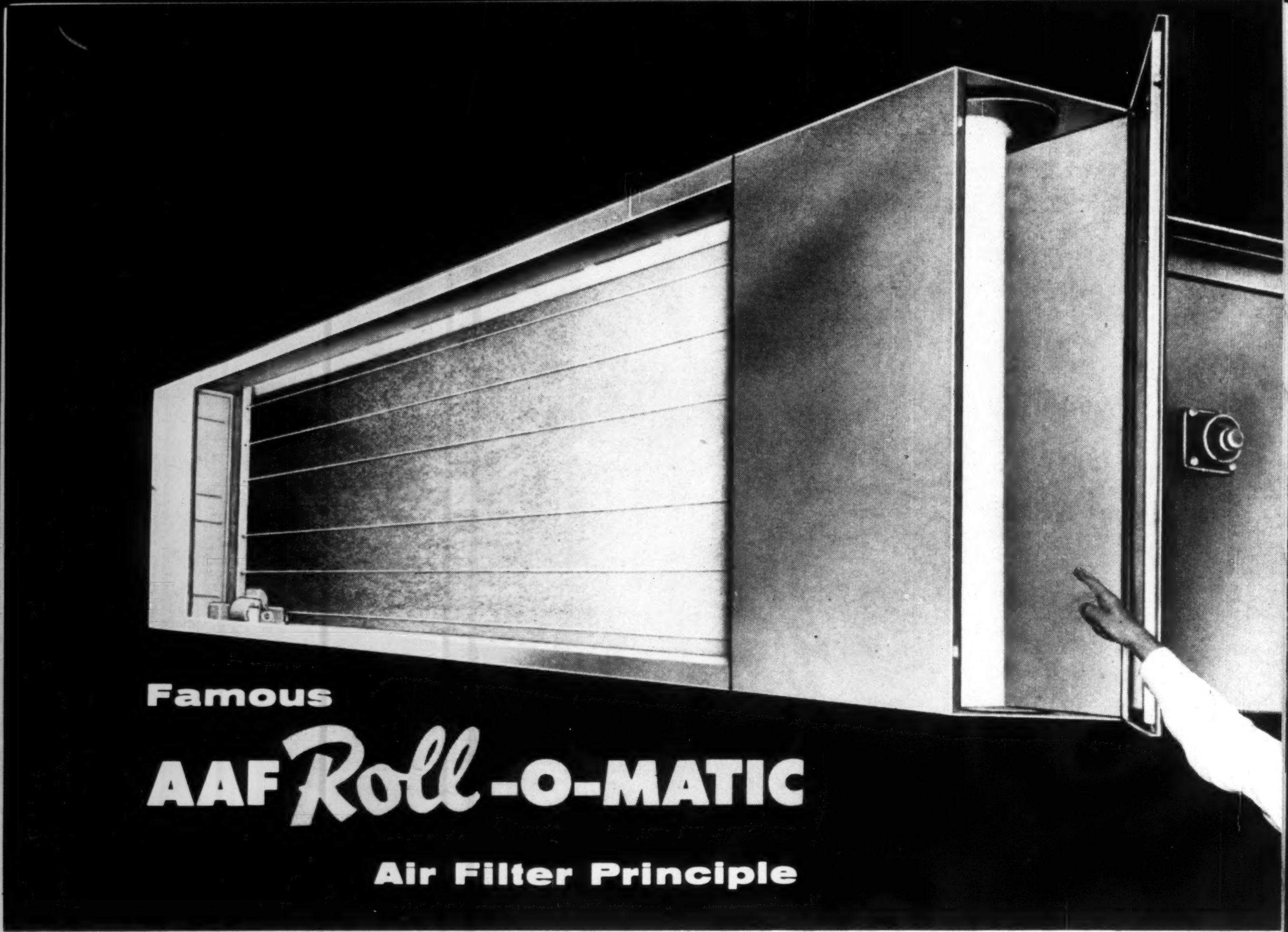
FRONT VIEW



Write for literature to Dept. H

GENERAL OFFICES

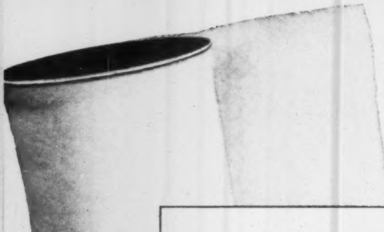
G. S. ZIEGLER & COMPANY
GREAT NECK, N. Y.
MINES: "CASTLE PEAK," "LITTLE BONANZA," "LITTLE EMMA" • PROCESSING PLANTS: CRAIG, COLO., PROVO, UTAH



Famous

AAF Roll-O-MATIC

Air Filter Principle



Exclusive bonded glass fiber filter curtain — over 60 feet of highly resilient media available in compact rolls only 13" in diameter.

- ✓ One roll of media ...lasts up to a year
- ✓ Loads like a camera
- ✓ Each roll of media can do job of a year's supply of disposable filters at ½ the cost
- ✓ Nothing to touch ...not even a button
- ✓ Automatically renewable media

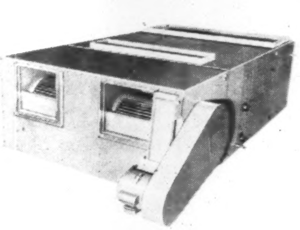
See the Roll-O-Vent at Booths 38, 40 at the ASH&AE Convention in Chicago.

...Announcing

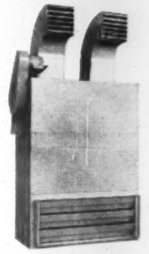
New Herman Nelson

Roll-O-Vent

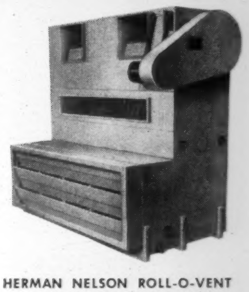
Heating, Ventilating and Cooling Units that change their own filters



HERMAN NELSON ROLL-O-VENT HEATING AND VENTILATING UNIT



HERMAN NELSON ROLL-O-VENT INDUSTRIAL UNIT HEATER



HERMAN NELSON ROLL-O-VENT AIR CONDITIONING UNIT

It's new. It's completely automatic. It's the exclusive Roll-O-Matic Filter now available on these three popular Roll-O-Vent air handling units. You simply put the roll of media in the unit—and forget it—for up to a year. It does *all* the work *automatically*. Just look at the better filtering and savings advantages provided only by new Roll-O-Vent units:

You save on the costly, time-consuming job of periodic filter changes.

You save by gaining maximum filtering efficiency *all year 'round* — because media is automatically changed at just the right time.

You save because ROLL-O-MATIC roll media *costs only half as much as* disposable filters.

Only Herman Nelson Roll-O-Vent "packaged" heating, ventilating and cooling units offer you Roll-O-Matic Filtering—exclusive development of American Air Filter Company. Write for new catalog.

Better Air Is Our Business

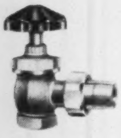
AAF herman nelson

American Air Filter

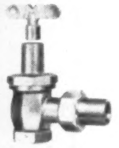
COMPANY, INCORPORATED

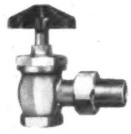
373 Central Avenue • Louisville 8, Kentucky

MARSH PACKLESS RADIATOR VALVES

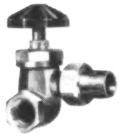

WHEEL HANDLE

GRADUATED


LOCK AND SHIELD

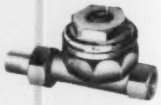

ANGLE PATTERN

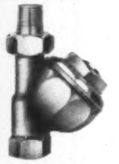
GLOBE PATTERN


CORNER PATTERN (Sectional Below)

MARSH THERMOSTATIC RADIATOR TRAPS

ANGLE PATTERN


STRAIGHTWAY PATTERN


VERTICAL PATTERN

LEFT HAND CORNER PATTERN

RIGHT HAND CORNER PATTERN

CUT OPEN VALVE

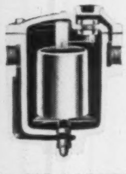
F & T TRAPS

No. 12, REPRESENTATIVE OF WIDE LINE

VENTS

No. 5 VENT, ONE OF MANY

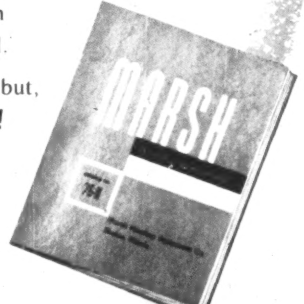
BUCKET TRAPS


No. 500 INVERTED BUCKET TRAP

All the best of their kind!

You probably have made certain Marsh products your standbys without realizing there are a lot more of them just as superlative as the ones you like so well.

Make the acquaintance of some of them here, but, better still—***Ask for this Marsh Catalog!***

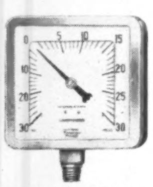


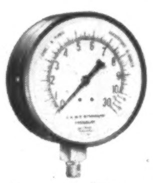
MARSH HEATING EQUIPMENT CO.
Sales affiliate of Jas. P. Marsh Corporation
DEPT. T, SKOKIE, ILL.
Marsh Instrument & Valve Co. (Canada) Ltd.
8407 103rd St., Edmonton, Alberta

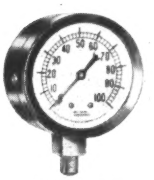
MARSH
Heating Specialties since 1865

MARSH BOILER GAUGES

THER-ALTI-METER (Square and Round)


INTERNAL SYPHON (Square and Round)


OUNCE-GRADUATED RETARD (Also Compound)


STANDARD (Also Compound)

Uniquely flexible, Armaflex is neat and easy to apply. Its closed cell structure and high insulation efficiency prevent damaging condensation. No separate vapor barrier need be applied. Armstrong Armaflex has a conductivity of 0.28 Btu-in./sq.ft.-hr.-°F. temp. difference at 75° mean temperature.

New insulation stops condensation on liquid cooling-heating lines

Now you can stop dangerous condensation on liquid cooling-heating, chilled water, and other cold lines with this new, flexible insulation, Armstrong Armaflex®. Made of foamed plastic, Armaflex has a closed cellular structure that completely seals out moisture and air. No separate vapor barrier is needed.

Armaflex has a remarkably low K-factor of 0.28 at 75° F. In a ½″ wall thickness, Armaflex prevents condensation under normal design conditions on indoor lines operating as low as 32° F. On heating cycles, it will withstand temperatures to 200° F.

You'll find Armaflex is easy to install, too. Highly flexible, it slips right over pipes and copper tubing, follows contours without any special cutting or fitting. If lines are already in operation, just slit Armaflex lengthwise, snap in place, and seal with Armstrong 520 Adhesive.

Fitting covers are no problem. You can fabricate them quickly from miter-cut pieces of Armaflex and cement them together. Armaflex is clean to work with, too. It will not chip, crumble, or rub off; waste is negligible. Armaflex comes in 6′ lengths, for pipes and tubing up to 3⅛″ o.d.

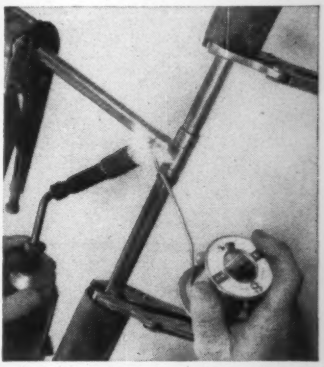
Get free booklet giving full facts on this remarkable new insulation. Write Armstrong Cork Company, 2001 Sherman Street, Lancaster, Pennsylvania.

Armstrong

INDUSTRIAL INSULATIONS

Easy to apply, Armaflex can be slipped over piping as it's being installed. A talc coating inside the pipe covering speeds slip-on application.

Fitting covers are quickly fabricated by miter-cutting Armaflex. They then are snapped in place and cemented with Armstrong 520 Adhesive.

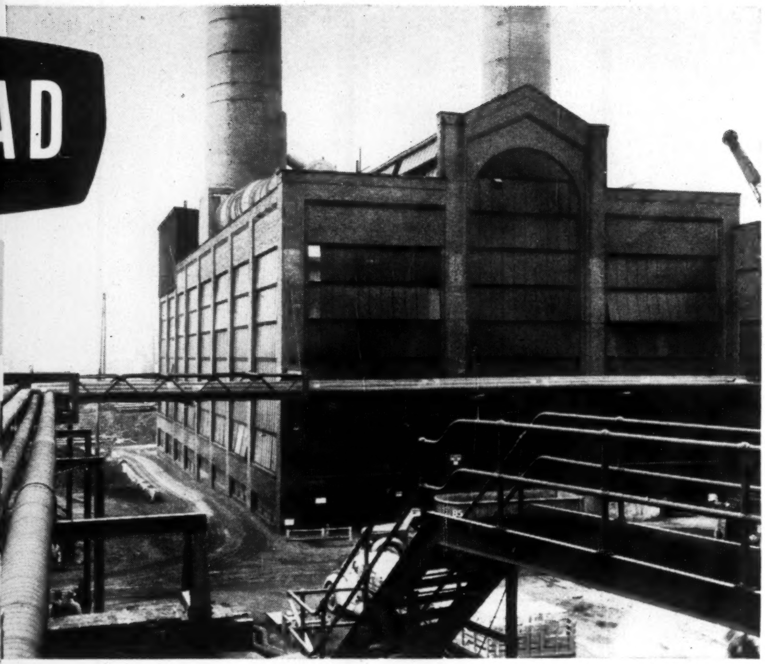


Self-extinguishing, Armaflex can be applied in advance to copper tubing and clamped back while fittings are sweated.

OVERHEAD

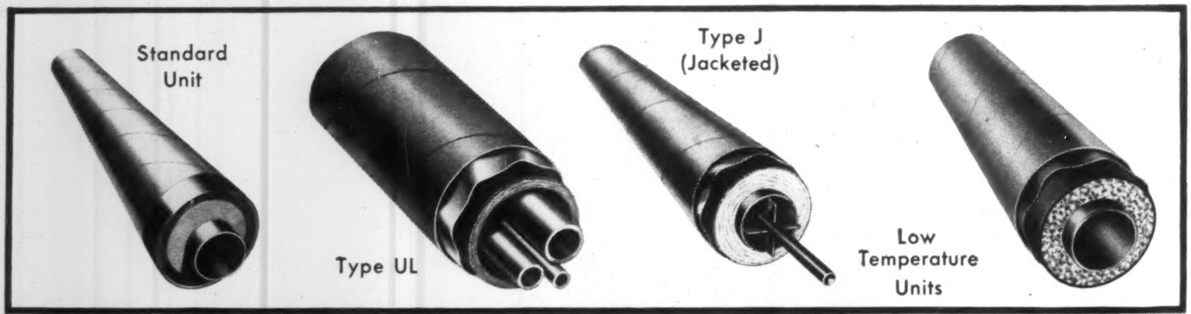
OR

underground



Ric-wiL offers the COMPLETE quality line of prefabricated piping systems

Ric-wiL factory prefabricated piping systems, *timed* to your schedule and *shipped* directly to the job site, can save you valuable time and money. Insulated units are available for steam, hot water, oil, other viscous fluids, process liquids and refrigeration lines . . . and remember . . . Ric-wiL is the quality system of exceptionally high mechanical strength and thermal efficiency.



Quality Piping Systems . . .
. . . of Exceptionally High Thermal Efficiency

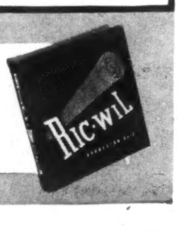
Ric-wiL INCORPORATED

PREFABRICATED **INSULATED PIPING SYSTEMS**

BARBERTON, OHIO

IN CANADA: THE Ric-wiL COMPANY OF CANADA LIMITED

Write for a copy of the new Ric-wiL Catalog . . .

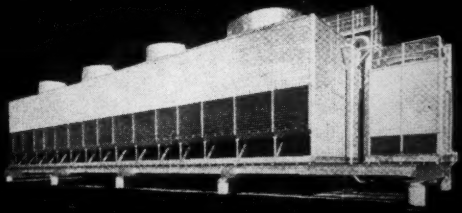


1st in Creative Thinking

LILIE-HOFFMANN

Cooling Towers, Inc.

Exclusive Builders of the World's Finest Cooling Towers for 56 Years



GENERAL OFFICES: 1450 S. VANDEVENTER AVE. • ST. LOUIS, MO.
Offices in All Principal Cities

YOU CAN COUNT ON KEWANEE -ENGINEERED PRODUCTS

his assignment:

TO HELP YOU FORGET

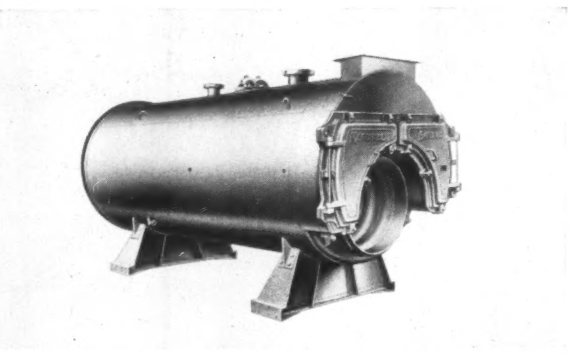
Better Homes and Gardens
Newsweek

Your customers read about Kewanee Boilers regularly in national publications.

Helping you and your customer avoid, solve and *forget* heating or power problems is the prime assignment of your Kewanee Man. He's trained for it, experienced in it—a qualified boiler specialist with the data you need, the knowledge you value.

And his catalog carries the exact size and type of boiler you need for any requirement from 70,000 btu's for a small home up to 651 h.p. for an industrial plant. Every unit fulfills the nation-wide Kewanee reputation for efficiency, fuel economy, low maintenance and long life . . . backed by 89 years of experience.

Kewanee men serve you from a coast-to-coast network of Kewanee Branch Offices. A telephone call brings the nearest one to work with you. American-Standard, Kewanee Boiler Division, 101 Franklin Street, Kewanee, Illinois.



When boiler room space is limited, this Kewanee M-800 Series is an ideal source for 15 lbs. steam or 30 lbs. water or high pressure steam 125 lbs. and up.

AMERICAN-Standard

KEWANEE BOILER DIVISION

not 2 or 3 . . . Young gives you 4 fan speeds

to fit occupants **exact** cooling and heating needs

Roomaire Conditioners by Young

Modern *Roomaire* Conditioners by Young offer unusual flexibility with 4 fan speeds to match *exactly* the unit capacity with the room occupants' comfort needs. Heating, cooling, dehumidifying, filtering and circulating air . . . are all effectively accomplished by a single compact *Roomaire* unit.
Easy to install, maintain and service . . . only three pipes serve each unit—water supply, water return, and drain. Removable front panel readily permits access to all component parts. Models and sizes available for every type of installation. For more *Roomaire* Conditioner facts, see your nearest Young representative, or write Young Radiator Company, Dept. A-517, Racine, Wis.

Roomaire is a Young Radiator Company trademark

CAPACITIES—

$\frac{1}{2}$, 1 AND 1$\frac{1}{2}$ TONS

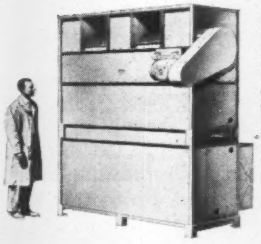
FREE-STANDING

CONCEALED FLOOR

CONCEALED HORIZONTAL

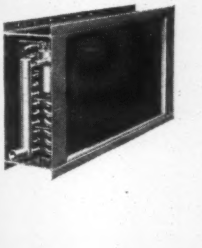
HORIZONTAL CABINET

YOUNG SECTIONAL DESIGN AIR CONDITIONING UNITS



For year 'round service for cooling, heating, filtering, circulating, humidifying and dehumidifying in any combination. Nine sizes: capacities from 400 to 22,000 cfm. Horizontal and vertical types.

YOUNG HEATING AND COOLING COILS



Young manufactures a complete line of heating and cooling coils for central heating or cooling systems.

Young **RADIATOR COMPANY**

RACINE, WISCONSIN

Creative HEAT TRANSFER ENGINEERS FOR INDUSTRY

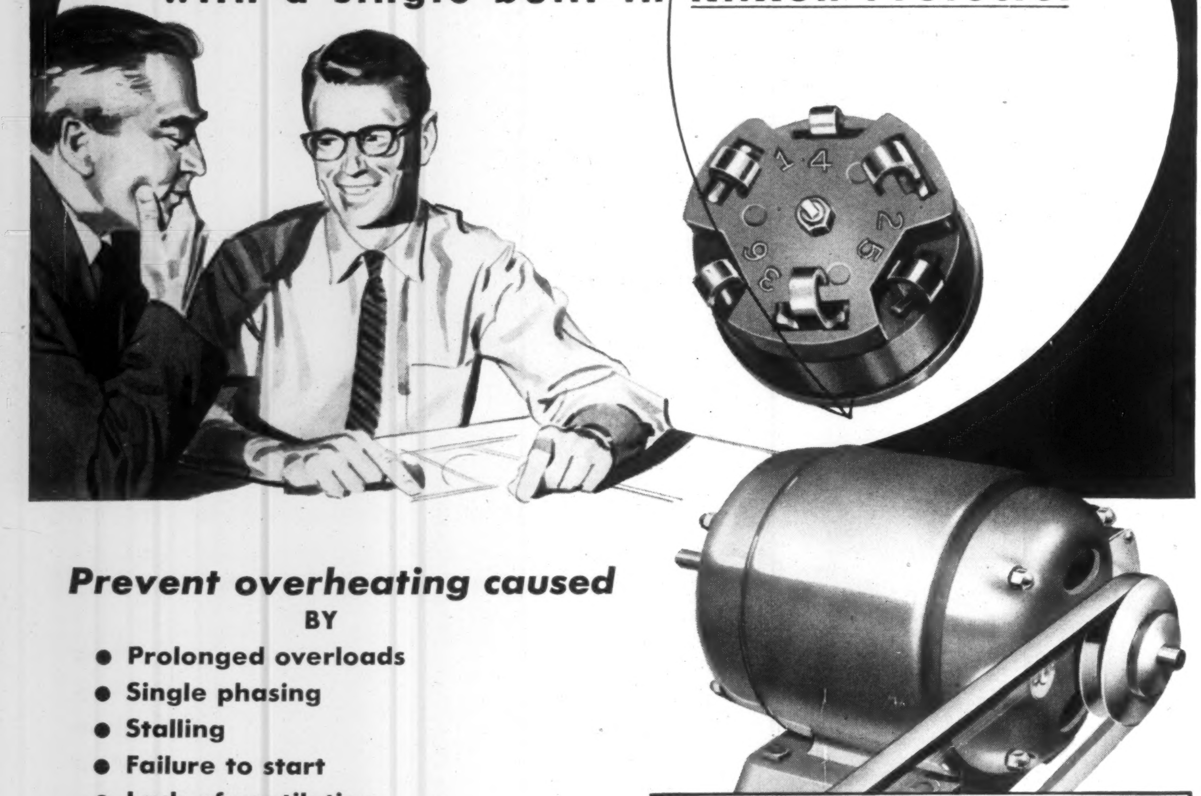
Heat Transfer Products for Automotive, Aviation and Industrial Applications. Heating, Cooling, Air Conditioning Products for Home and Industry.

Executive Office: Racine, Wisconsin, Plants at Racine, Wisconsin, Mattoon, Illinois

Get Full Protection Engineered into

3-Phase Motors

with a single built-in Klixon Protector



Prevent overheating caused BY

- **Prolonged overloads**
- **Single phasing**
- **Stalling**
- **Failure to start**
- **Lack of ventilation**
- **Increase in ambient temperature**
- **Plugging or reversing duty**

Motor manufacturers everywhere are doing a fine job of building Klixon Protectors into their 3-phase motors, just as they have over the years in their single phase motors, to assure you of maximum work output with minimum down time.

Klixon 3-phase Protectors are now available for motors ranging from fractional HP up to 7½ HP (600V).

- **Reduce Production Down Time**
- **Eliminate Motor Burnouts**
- **Minimize Motor Repairs and Replacements**
- **Assure Maximum Motor Capacity Under Any Conditions**
- **Simplify Motor Controls**

Specify **AND USE MOTORS WITH BUILT-IN KLIXON PROTECTORS**

Specify and use motors with Klixon Inherent Protectors. The additional cost is low . . . the savings high. Write today for Bulletin MOPR1 which explains inherent motor protection in single and three phase motors.

KLIXON®

METALS & CONTROLS CORPORATION
SPENCER THERMOSTAT DIVISION
3401 FOREST STREET, ATTLEBORO, MASSACHUSETTS

SKIDMORE PUMPS have set a standard for performance and dependability since 1921

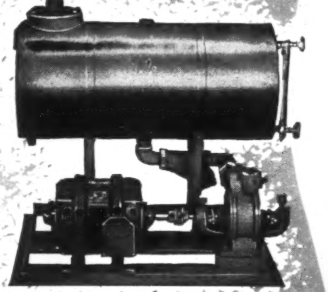
SPECIFY WITH CONFIDENCE

There's a Skidmore Pump designed for each and every heating requirement.

Write for bulletins

TYPE "CVS"

New, wider range of discharge pressures—from 10 to 40 lbs. Capacities range from 500 to 10,000 sq. ft. E. D. R.

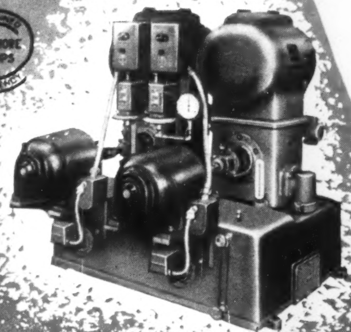


TYPE "TM"

Completely assembled on either steel or cast iron base —capacities, for boilers up to 250 H.P., with discharge pressures to 150 lbs.

TYPE "HS"

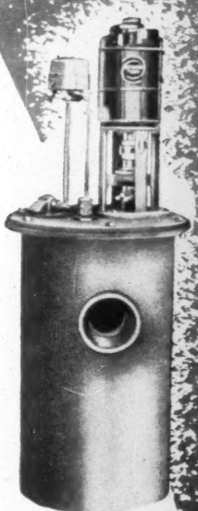
Sturdily constructed for dependable service at small investment — capacities 1,000 to 65,000 sq. ft. E. D.R., discharge pressures from 10 to 75 lbs.



MAINTAINED SKIDMORE PUMPS EFFICIENCY

VACUUM TYPE

Automatically adjusts itself to the varying conditions of the system. Efficiency maintained. Capacities ranging from 5,000 to 100,000 sq. ft. E.D.R.



TYPE "UV"

Designed for low return installations — capacities, 2,000 to 40,000 sq. ft. E.D. R. and discharge pressures from 10 to 75 lbs.

Send Coupon For Bulletins

SKIDMORE CORPORATION

ST. JOSEPH, MICHIGAN

SKIDMORE CORPORATION, ST. JOSEPH 5, MICHIGAN

Please send bulletins on the following pumps checked below.

CVS TM HS UV VACUUM

Name ....

Firm ....

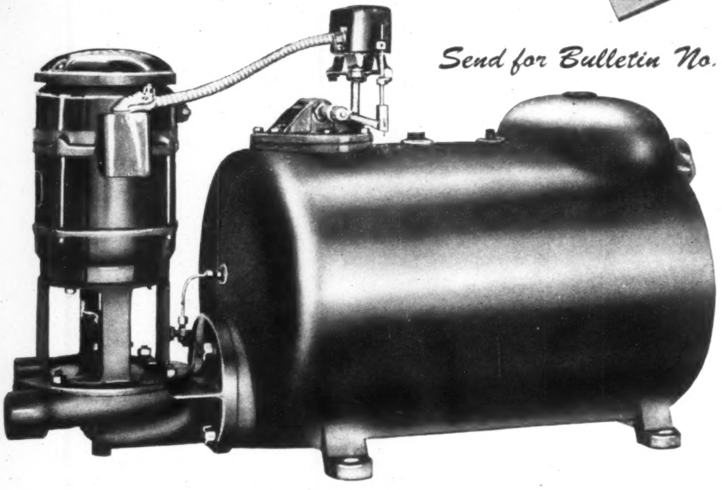
Address ....

City .... State ....

Skidmore Pumps

Here are the answers to— your Heating Pump Problems

Send for Bulletin No. 10-B



- **Quiet Operation**
- **Low Inlet Connections**
- **Accessibility for Inspection**

TYPE "VC" SINGLE UNIT

Condensation Pump and receiver has low inlet connection . . . operates quietly . . . impeller is bronze centrifugal enclosed type. Especially designed for handling hot condensate, entire unit can be removed for inspection without disturbing piping.

All Skidmore Pumps are furnished in either single or duplex type according to installation requirements.

For complete information call or write your nearest Skidmore Pump Representative.

MORE FAMOUS SKIDMORE PUMPS

SKIDMORE CORPORATION • ST. JOSEPH, MICHIGAN

Repeat orders prove—

What they say:*

"No maintenance cost"

11 stokers

"controlled heat without waste"

30 stokers

"convinced we made wise decision"

20 stokers

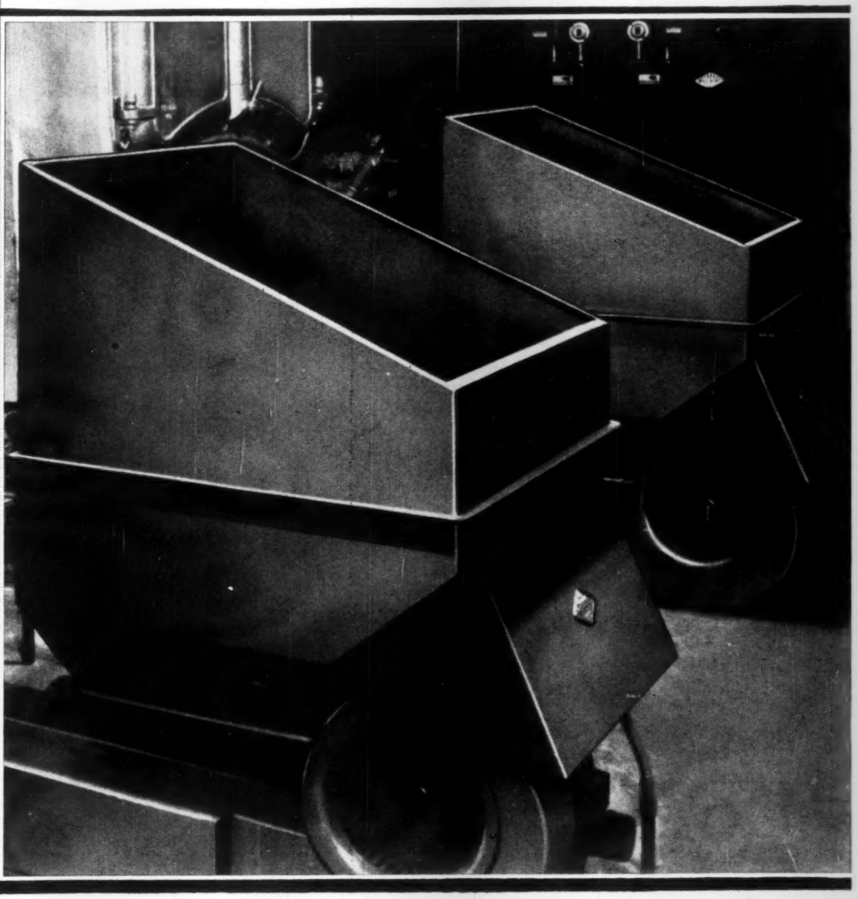
"recommend for trouble-free service"

72 stokers

"after rigid usage, found very satisfactory"

15 stokers

**Owner's name available*



WILL-BURT'S BEST

NOT JUST ANOTHER STOKER...

but a proven way to years of comfort with clean, safe, economical heat

Repeat orders *are* the proof! Even without praise such as is contained in the brief quotes above*, when purchasers come back again and again, a manufacturer *knows* his product is doing the job.

That's been the case with Will-Burt Stokers for some twenty-seven years. Orders and re-orders continue to come in from people we've dealt with for years—proving that Will-Burt Stokers *do* provide the greatest heating efficiency with the greatest economy and the least maintenance.

Will-Burt Stokers have always been manufactured by the same people, in the same place... more every year... *proof* that if you need service, you will know where to get it. If you do not know about Will-Burt features, it will pay you to get the facts. Ask us—and ask your architects and engineers. (It pays to have their advice.)

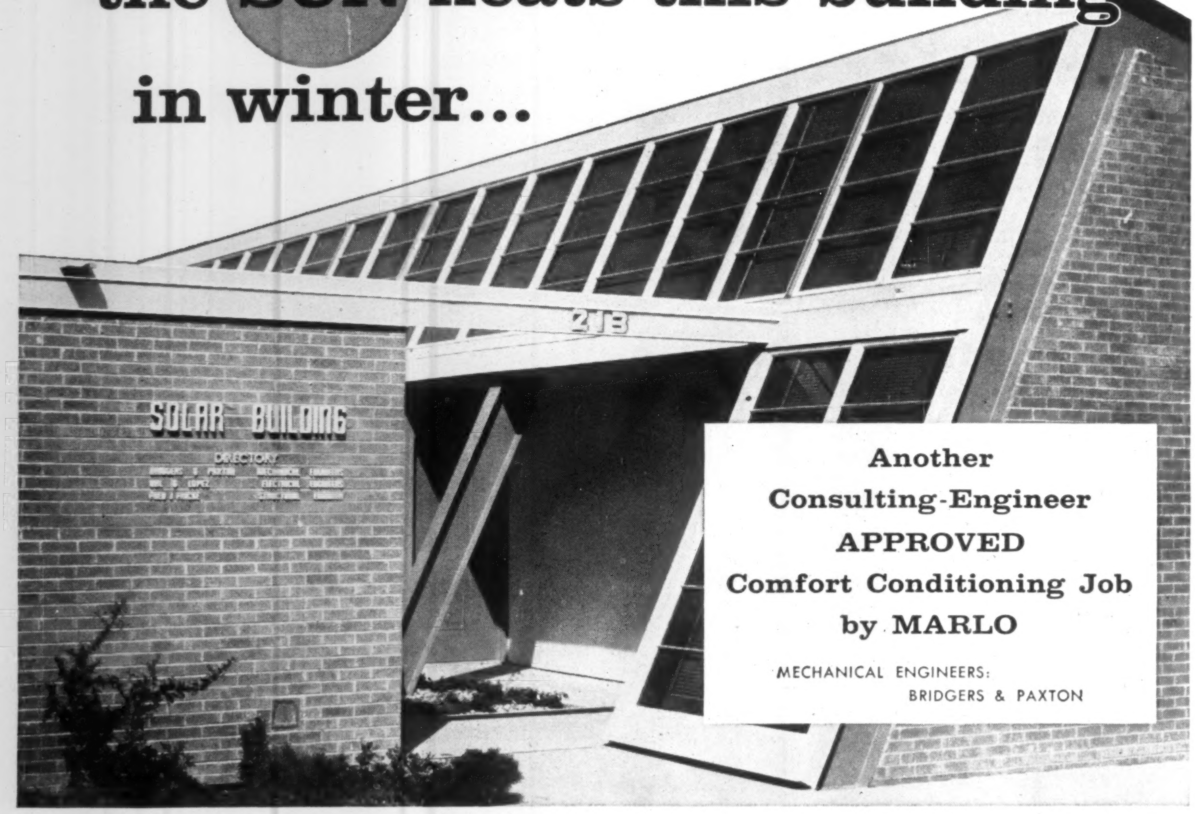
Write for complete Reference Manual, AIA File No. 30-G-3, valuable for architects, engineers, contractors, and specifying authorities. Ask also for brochure, "The Logic of Stoker Heating."

The WILL-BURT Company

P.O. BOX 902, ORRVILLE, OHIO

OUR TWENTY-SEVENTH YEAR IN THE STOKER BUSINESS •

the SUN heats this building in winter...



Another
Consulting-Engineer
APPROVED
Comfort Conditioning Job
by MARLO

MECHANICAL ENGINEERS:
BRIDGERS & PAXTON

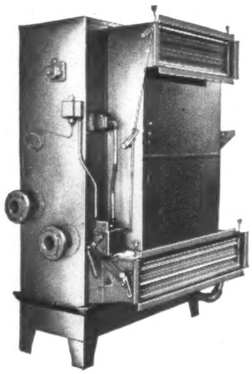
MARLO helps cool it in summer

This unique building in Albuquerque, N. M., is believed to be the first solar-heated commercial building in the United States.

Marlo heat transfer equipment is an important part of this installation which combines solar heating, evaporative cooling and an auxiliary heat pump.

Occupants of this unusual building include its owners and designers, the mechanical engineering firm of Bridgers & Paxton. Architects were Stanley and Wright, general contractor was Paul Priest. All are of Albuquerque.

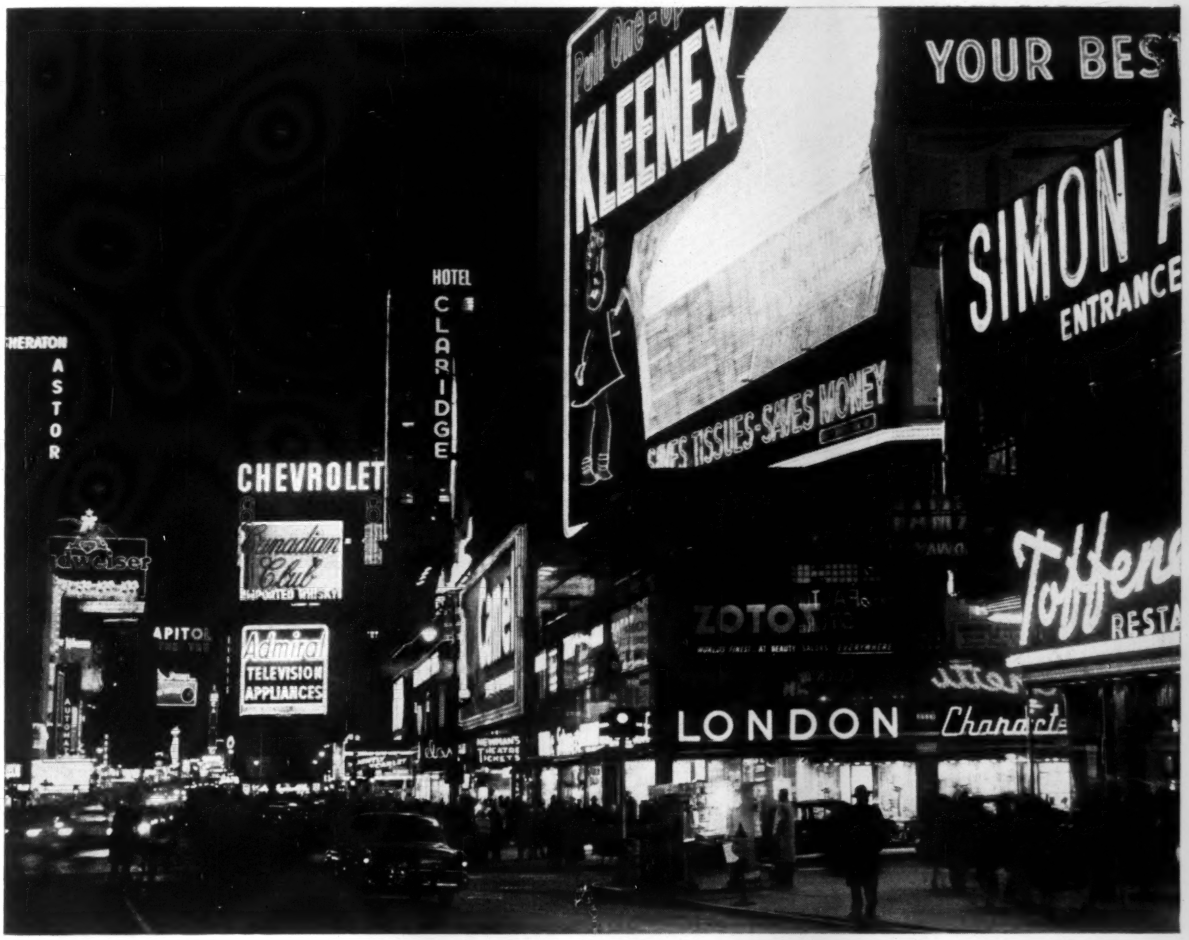
Marlo equipment has played an important role in many distinctive air conditioning installations in this country and abroad. To learn how it can serve your needs efficiently and dependably, write us today.



MARLO coil co.

SAINT LOUIS 10, MISSOURI

Quality Air Conditioning and Heat Transfer Equipment Since 1925


KLEENEX
YOUR BEST
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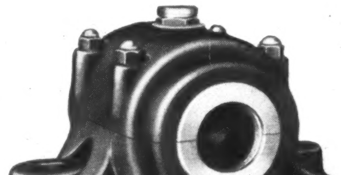
Bright Lights–That Never Fail



SLEEVOIL BEARINGS

Dodge Sleevoil Bearings are available in plain type, water-cooled, or air-cooled for outside use—all self-aligning—all drilled for thermostatic emergency warning. Shaft sizes from 1-7/16″ to 10″.

The brilliant lights of Broadway match the stars in the certainty of their rising. A black-out from power failure is almost unthinkable.

One factor that contributes to the dependability of this steady power supply is the bearing that insures unfailing operation of mechanized draft in the generating plant.

These Bearings are Dodge Sleevoil.

Generating plants throughout America—including those in such metropolitan centers as New York, Detroit, San Francisco, Los Angeles—use these super-quality bearings.

The Sleevoil Bearing is a Dodge development, created especially to meet the exacting requirements of fan and blower service. You are invited to write us for our new Engineering Catalog D56, which contains detailed description, sizes, dimensions.

DODGE MANUFACTURING CORP., 1600 Union St., Mishawaka, Indiana

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on modern power transmission machinery for *modern* installations. Look for his name under "Power Transmission Equipment" in your classified telephone directory.

DODGE
of Mishawaka, Ind.

NEW

from K&M best in asbestos®

KaytherM®

PIPE INSULATION

Highly efficient from 250° F. to 1350° F.

LIGHT IN WEIGHT *for easiest handling.*
EXTRA STRONG *to allow for job pre-fabrication.*
DIMENSIONAL STABILITY *helps prevent expansion-caused leaks.*
INSOLUBLE IN WATER, CHEMICALLY STABLE. *Ideal for outdoor use.*

Years of research by Keasbey & Mattison, insulation pioneers, have resulted in a new, highly efficient, pipe insulation made of lime and silica (hydrous calcium silicate) with asbestos fibers added for strength. It's called KaytherM and it's strong, light in weight, and easily handled and cut.

KaytherM Pipe Insulation comes in simplified thicknesses and in pipe sizes up to 33″ in diameter. KaytherM is also available in block form.

AVERAGE PHYSICAL CHARACTERISTICS—(Bone Dry Basis)

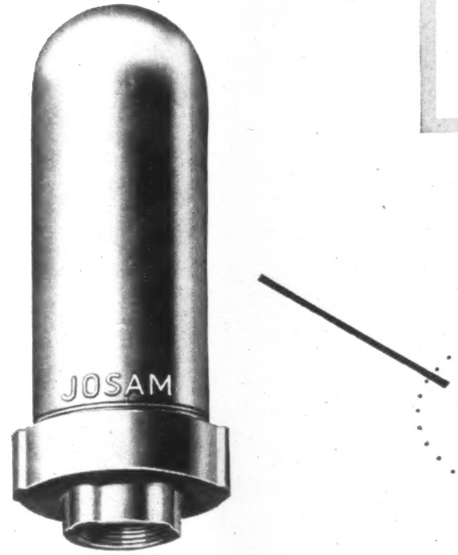
Temperature limit	1350° F.
Density, lbs./cu. ft.	11.5
Modulus of Rupture, lbs./sq. in.	65
"K" Factor at mean temperatures	100° F.—0.330 400° F.—0.465 800° F.—0.650

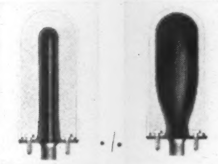
Write to us for full descriptive literature.

KEASBEY & MATTISON COMPANY • AMBLER • PENNSYLVANIA

ENGINEERS WANTED—Career opportunities open for men qualified in product development, machine design, automation, plant management, plant engineering and applied research. Write to Director of Engineering, Keasbey & Mattison Company, Ambler 4, Pa.

in plumbing drainage... it costs no more for the... VERY BEST





ABSORBO tube and insert shown in normal position, before faucet or valve is opened.

ABSORBO tube expands against insert as it absorbs shock and energy caused by sudden closing of valve or faucet, or sudden change in flow.

As shock recedes, tube and insert return to normal positions as in figure at left.

Josam

series 1480

SHOCK ABSORBERS

ELIMINATE "WATER HAMMER"!

• Noisy, destructive water hammer is unpredictable — it will occur on the finest installations — it happens without warning on any water or liquid plumbing supply line — in schools, hotels, theatres, hospitals, institutions — and even in homes. Josam Shock Absorbers eliminate this disturbing noise, the possible damage to equipment, and destructive leaks in valves and connections. You get "hospital quiet" on all plumbing lines! Their cost is so little compared with the protection they provide, that Josam Shock Absorbers should be installed on every new and old piping system. Here again, it costs no more to use the best — *in plumbing, you use the best when you use JOSAM!* It costs less in the "long run".

Send coupon for free literature.

JOSAM MANUFACTURING COMPANY
General Offices and Manufacturing Division
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Josam products are sold through plumbing supply wholesalers.

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Please send copy of Manual "S" on Water Hammer

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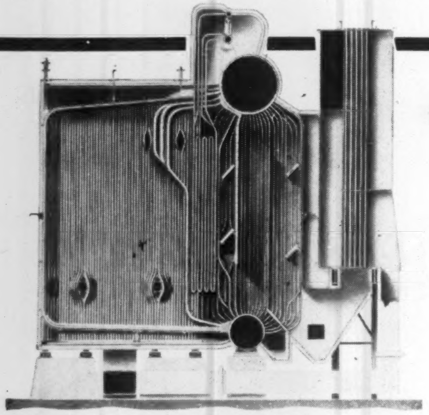
one of these C-E standard boilers is . . . .
DESIGNED FOR YOUR PLANT

If your steam needs range between 4,000 and 120,000 pounds per hour, one of these versatile C-E Boilers will give you economical, standout performance. For while they are standard in design (which means lower first cost and proven performance), they're still *flexible* enough to be easily adapted to meet almost any standard requirement.

Chances are that one of the C-E standard boilers is the answer to your steam needs. But whatever they may be, C-E can fill them. For C-E Boilers are made in sizes and types for *any* capacity — for *any* pressure — *any* fuel or method of firing.

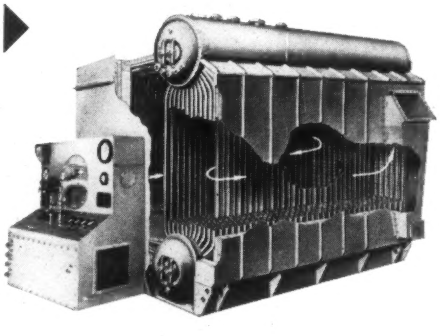


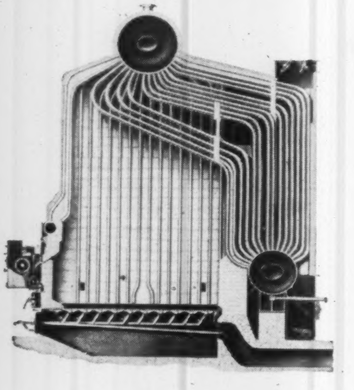
◀ C-E Vertical Unit Boiler, Type VU-55

The VU-55 Boiler is available in five sizes ranging from 50,000 to 120,000 lb of steam per hr. It is designed for pressures from 250 to 750 psi for all sizes and for up to 300 degrees F of superheat. Heat recovery equipment may be added if desired. VU-55 Boilers are designed for the pressure firing of oil or gaseous fuel and require no induced draft fan. They are equipped with tangential burners and tangent furnace tubes to assure a level of performance which compares favorably with modern utility practice. Shop assembly of furnace wall panels and boiler screen tubes saves time and money in handling, transportation and erection. The absence of outside downcomer tubes and ducts makes possible the attractive, streamlined exterior of the VU-55.

C-E Package Boiler, Type VP ▶

This completely shop-assembled boiler is available in fourteen sizes from 4,000 to 40,000 pounds of steam per hour . . . for operating pressures up to 500 psi . . . for pressure firing of liquid or gaseous fuels. The VP Boiler has more water-cooled area per cubic foot of furnace volume than any other boiler of its size and type. The large lower drum — 30-inch diameter — permits a simple, symmetrical tube arrangement . . . greater water storage capacity . . . easy access for washing down or inspection. A centrifugal fan, which operates at low speed and is exceptionally quiet in operation, is standard equipment. The simple baffle arrangement results in low draft loss . . . simple soot blowing . . . no dead pockets . . . high heat absorption. The VP is enclosed in a reinforced gas-tight, welded steel casing, and shipped completely assembled with firing equipment, fittings and forced draft fan. For foundation, it needs only a simple concrete slab.





◀ C-E Vertical Unit Boiler, Type VU-10

The VU-10 is available in nine sizes from 10,000 to 60,000 pounds of steam per hour . . . for operating pressures up to 475 psi . . . superheat to 200° F in 20,000-60,000 lb range . . . for solid, liquid, or gaseous fuels. This boiler is a completely standardized design adaptable to many conditions. It is bottom-supported and needs no outside supporting steel. It operates efficiently over a wide range of output, and is easy to operate and to maintain. All parts are easily accessible for inspection. The VU-10 is a complete unit — boiler, furnace, setting, fuel-burning equipment, controls, forced draft, heat recovery equipment (if desired). Regardless of fuel, the same general cross-sectional arrangement of drums, convection bank and furnace wall cooling is used. Uniform design through each transverse section assures even water level in the drum and uniform expansion.

COMBUSTION ENGINEERING

Combustion Engineering Building, 200 Madison Avenue, New York 16, N. Y.
Canada: Combustion Engineering-Superheater Ltd.

STEAM GENERATING UNITS; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; HOME HEATING AND COOLING UNITS; DOMESTIC WATER HEATERS; SOIL PIPE

C-E

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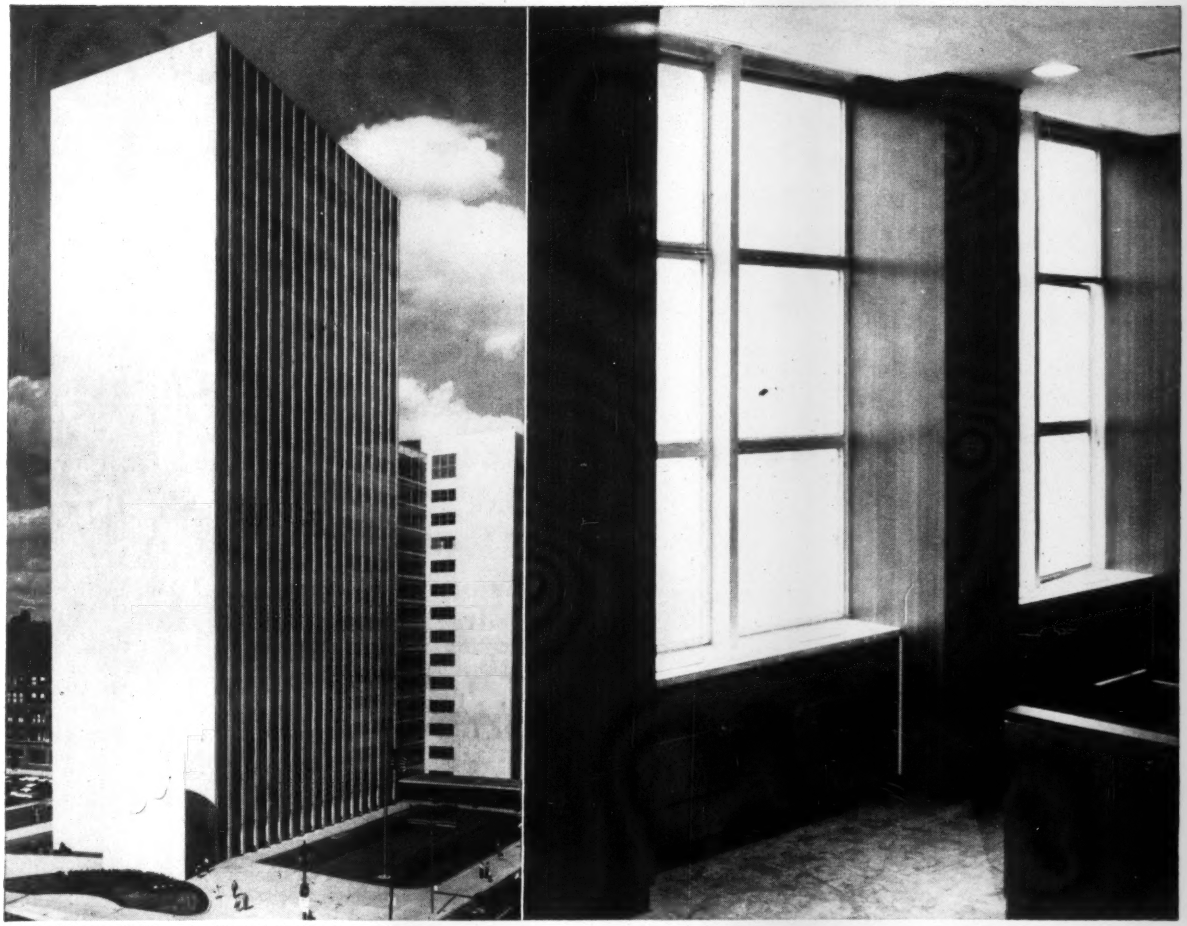

Harley Ellington & Day – Architects & Engineers

CITY-COUNTY BUILDING IN DETROIT INSTALLS 3,600 BUENSOD-STACEY DUAL DUCT AIR MIXING UNITS

Here's why—

The pioneer work done by Buensod-Stacey made the Buensod Air Mixing Units the only ones suitable for an installation of this magnitude. Here are the advantages they offer –

The engineers found them efficient. They are the only dual duct mixing units with a self-contained, completely automatic volume control. This control maintains the desired supply of conditioned air regardless of variations in pressure at the inlet.

The contractors found them practical. The automatic volume control, when once set, does not need rechecking. Adjust one nut and the unit delivers the required air volume.

The architects found them flexible. They allow each individual room to maintain its own separate temperature. You can heat one room and cool the one next to it.

The owners found them economical. One system conditions the entire building – needs no seasonal changeover. There is no local air recirculation – therefore no need for individual circulating fans. There is no need for a separate heating system.

The occupants find the result – totally comfortable. The Dual Duct system provides completely filtered air, at any desired temperature, at all hours of all seasons. The mixing units are *quiet* – they are acoustically treated to eliminate noise. They are not drafty, but diffuse air evenly, steadily throughout the room.

Buensod Dual Duct Mixing Units are useable in large or small, existing or new buildings. Application data available for consulting engineers and contractors.

BUENSOD-STACEY
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Buensod-Stacey, Inc. 45 West 18th Street New York 11, N. Y.
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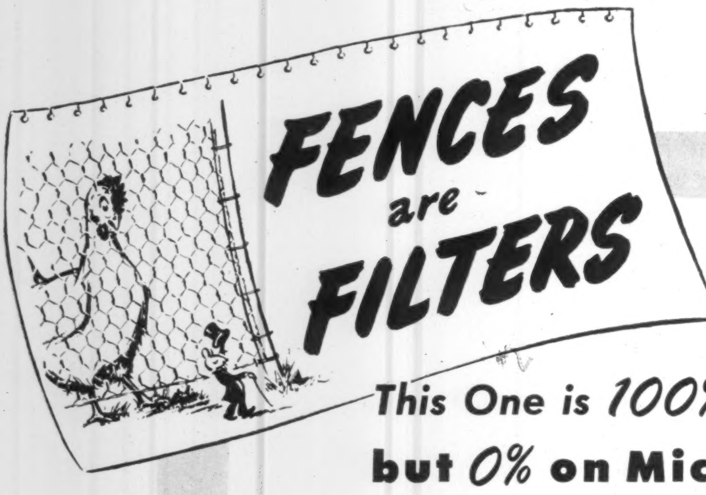
See Our Display
Booth 409
Chicago, Feb. 25-Mar. 1



This One is *100%* Efficient on Chickens — but *0%* on Mice!

SO— when you compare filter efficiencies, use the same test

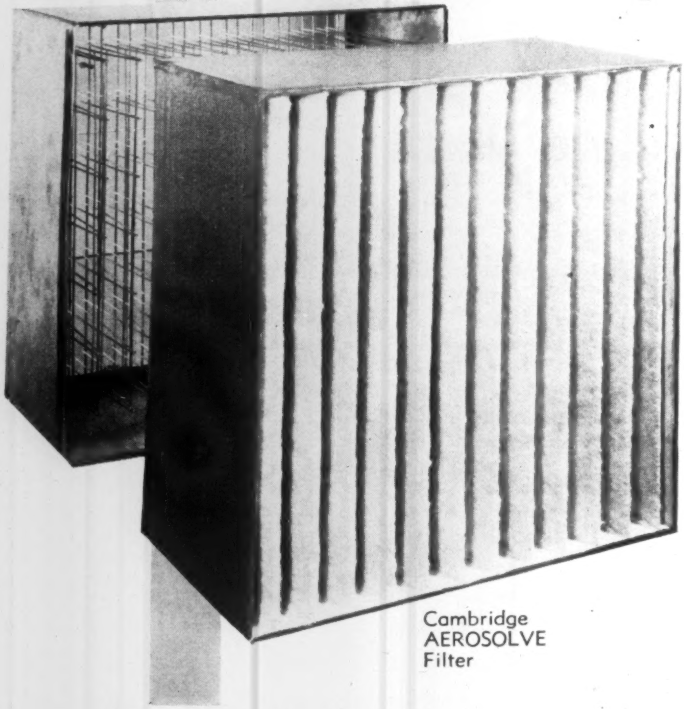
STANDARD TESTS — PERCENTAGE OF EFFICIENCY

TYPE FILTER	ASHAE (Weight Test)	NBS TEST # (Atmospheric Dust)	DOP TEST (0.3 Micron Smoke)
Cambridge Absolute	*	*	**99.95 Min.
Cambridge Aerosolve 95	*	90-95	80-85
Cambridge Aerosolve 85	99	80-85	50-60
Cambridge Aerosolve 35	96	30-35	20-30
Electric Precipitator	99	85-90	60-70
2″ Cleanable	76	8-12	2-5
2″ Throwaway	76	8-12	2-5

*Practically 100%. Test not practical for more accurate reading.

#National Bureau of Standards Discoloration Test.

**Maximum Allowable Penetration of Dioctyl Phthalate Smoke 0.05%. Every filter individually tested.



Cambridge
AEROSOLVE
Filter

Cambridge filters, used alone or with prefilters to take out the "chickens," give you high-efficiency air cleaning at only a fraction of previous costs. Wide range of efficiencies, from the Cambridge AEROSOLVE 35 to the world-famous Cambridge ABSOLUTE.

Cambridge AEROSOLVE Filters have a rugged permanent frame for long life. Light, compact cartridges, in a wide range of efficiencies, provide long service life and are easily replaced. No maintenance required.

Take advantage of Cambridge's unequalled experience in the field of high-efficiency air filtering. Ask the Cambridge man to help you lick your tough filtering problems.

Write for
AEROSOLVE Filter Bulletin 105A
ABSOLUTE Filter Bulletin 106A

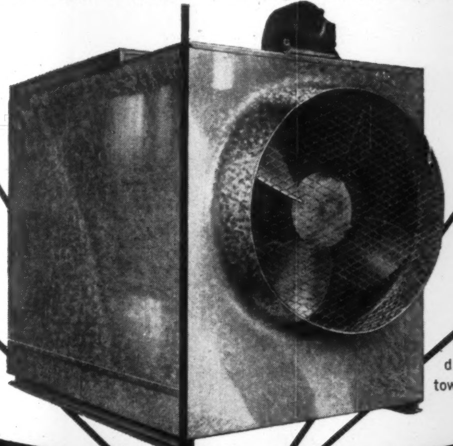
CAMBRIDGE FILTER CORP.

Pioneers in High-Efficiency Air Cleaning

734 E. Erie Blvd. Syracuse 3, N. Y.

Representatives in Principal Cities

See the Dover Complete Line in Booth N-343, 13th International Heating & Air Conditioning Exposition, Chicago, Feb. 25- March 1, 1957



Series CF horizontal induced draft tower. Vertical induced draft and natural draft towers also available.

DOVER TOWERS

ARE HOT DIP GALVANIZED*

TO STOP RUST COLD!

*After Fabrication

Why Dover Hot-Dip Galvanizes *After* Fabrication

Why doesn't Dover simply use *mill galvanized* steel? The answer is simple — the results are important. Shearing, braking, forming and welding operations on mill galvanized steel tends to destroy the zinc coating, leaving certain spots unprotected. Once the protective zinc coating is removed, rust and corrosion go to work causing costly damage. For this reason, Dover does all the fabricating first, and *then* hot dips the entire assembly. The result is complete protection against rust and corrosion.

No Costly Rust, Corrosion No Unsightly Appearance

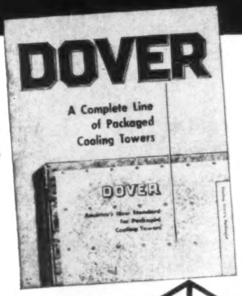
Dover packaged cooling towers, 2 to 100 tons capacity, are hot-dip galvanized after fabrication for two very important reasons; first, to provide you with a cooling tower that will not be damaged by costly rust and corrosion. Second, to provide you with a tower that will stay new looking after many months of use.

ONLY DOVER GIVES YOU THIS COMPLETE ASSURANCE AND PROTECTION AT NO ADDITIONAL COSTI

FREE OFFER

DOVER PACKAGED COOLING TOWERS MEET THE RIGID REQUIREMENTS OF THE NEW YORK CITY DEPARTMENT OF BUILDING

Send today for a copy of Dover Catalog. Gives all the facts and specifications of Dover's complete line.



DOVER Mfg. Co.
Dept. 100, 3117 Weatherford Ave., Independence, Missouri

☐ Send copy of Dover Catalog.
☐ Send name of nearest Dover representative.

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Left to right: Don Wood, General Sales Manager—John Morrill, General Manager—Clyde Ploeger, Director of Engineering.

WE WANT YOUR COMPRESSOR BUSINESS!

Our name is Evansville Division of Bendix-Westinghouse Automotive Air Brake Company. We're a new name in the manufacture of refrigeration and air-conditioning compressors, but in manufacturing other types of compressors we've been a leader for many years.

We want your business and feel we're well qualified to handle it. Our product consists of a complete line of hermetic compressors and condensing units ranging in capacity from 1/4 to 7 1/2 H. P. They're designed for low- and high-temperature applications and offer several new exclusive features which have already resulted in substantial orders from some of the most respected names in the industry.

Our manufacturing facilities located here in Evansville, Indiana, are big, modern, well-staffed and well-tooled. We can handle any size order you can give us.

Our personnel know this business from over 33 years' manufacturing history in this field and are dedicated to carry out our main policy . . . to provide you with the finest products and best service available.

We hope to get acquainted with you soon.

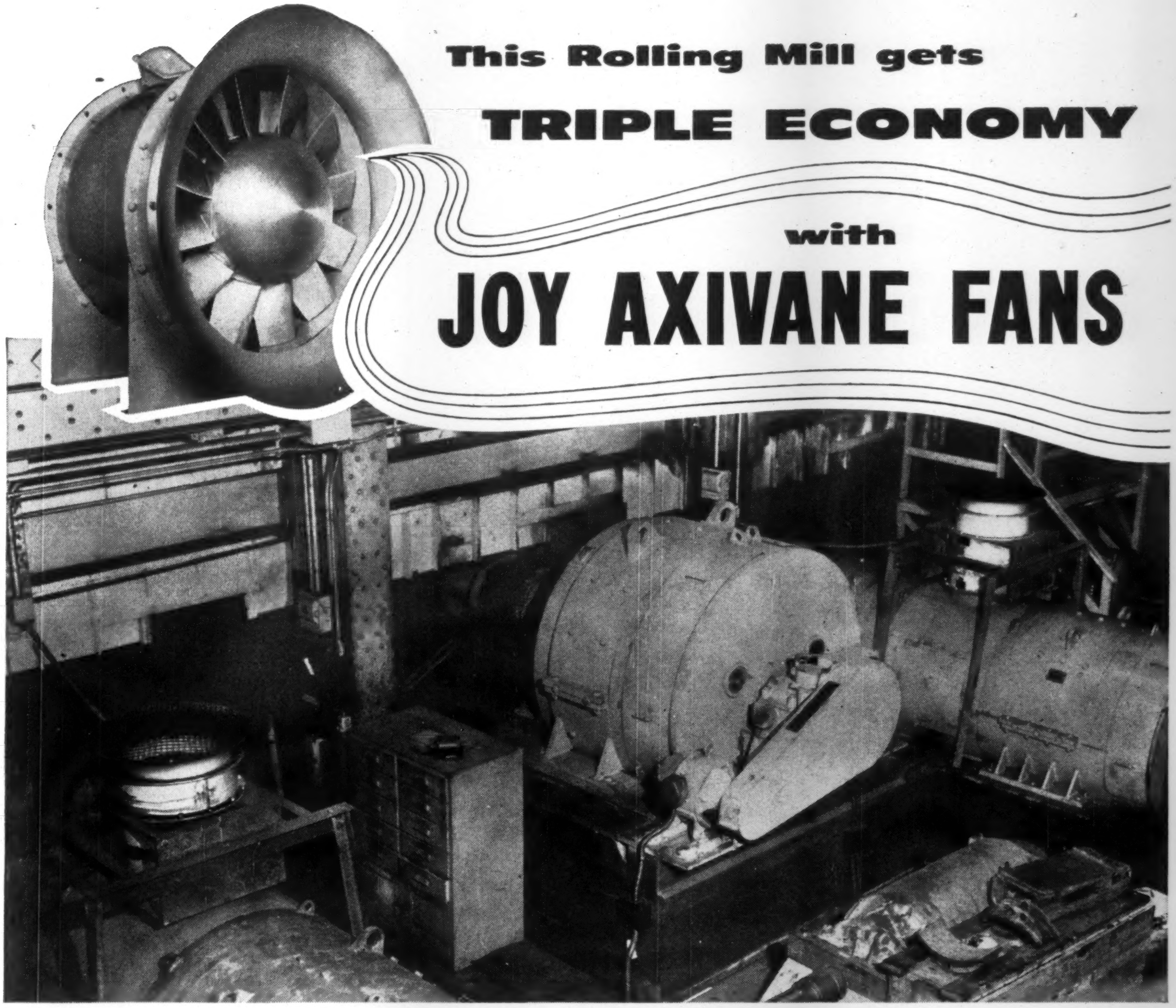
NOT IN APPLIANCE BUSINESS

Neither this division nor the parent company—Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio—has any connection with appliance manufacturing. Bendix-Westinghouse is a joint subsidiary of Bendix Aviation Corporation, Detroit, Michigan, and Westinghouse Air Brake Company, Wilmerding, Pennsylvania. EVANSVILLE DIVISION, EVANSVILLE 11, INDIANA.

EVANSVILLE DIVISION of

Bendix-Westinghouse

Automotive Air Brake Company



This Rolling Mill gets TRIPLE ECONOMY with JOY AXIVANE FANS

They Save POWER · LABOR · SPACE

A typical example of the adaptability of Joy *Axivane* Fans to unusual ventilating applications is this one in the motor room of one of America's largest rolling mills. An *Axivane* fan is mounted atop each motor housing . . . its job is to cool the windings and other important components of the drive motor.

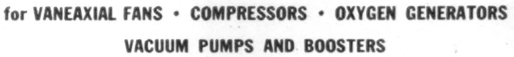
Because of the in-line design of the Joy fans, no elaborate duct system was required . . . installation was considerably simplified. Because a Joy fan is actually built *around* its motor, power-loss from motor to fan is negligible. Space requirements, as shown above, are at the irreducible minimum.

Joy *Axivane* Fans will show you new standards in efficiency, compactness, quietness, and outstanding versatility. There are 136 models for volumes up to 200,000 CFM and pressures to 11″ wg. Get the full story by writing to **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Write for FREE Bulletin 93-41

Consult a Joy Engineer

for VANEAXIAL FANS · COMPRESSORS · OXYGEN GENERATORS
VACUUM PUMPS AND BOOSTERS



WSW I 6113-93

JOY

WORLD'S LARGEST MANUFACTURER
OF VANEAXIAL-TYPE FANS

in the air moving and conditioning field—

AMCA* HELPS *YOU* DO YOUR JOB *BETTER!*

If you are an architect, consulting engineer, building contractor, or plant engineer—if you are in any way concerned with the design, installation, or maintenance of air moving and conditioning systems—AMCA is now helping you to do your job better.

* *what is AMCA?*

AMCA, the Air Moving and Conditioning Association, Inc., is a non-profit trade association formed this year, in the service of industry and the public, by the merger of three predecessor organizations.

* *who comprises AMCA?*

Fifty-one leading manufacturers of air moving and conditioning equipment have joined to form AMCA. Member companies manufacture products falling within one or more of the Association's major product divisions: Centrifugal Fans; Industrial Axial and Propeller Fans; Central Station Air Conditioning units; Power Roof Ventilators; Unit Heaters; and Residential Fans.

* *how AMCA benefits you*

The activities of AMCA benefit you in many ways, both directly and indirectly. Here are a few:

1. AMCA compiles and makes available to you technical information relating to air movement, heating and cooling.
2. To protect you, AMCA establishes and promotes the use of standards for equipment performance and testing methods.
3. AMCA conducts exploratory research on basic industry problems to improve the products and methods you will use.
4. AMCA functions as a clearing house for all industry activities and stimulates the exchange and dissemination of ideas.
5. AMCA maintains close liaison with public agencies, serving as spokesman on matters regarding the industry.

AIR MOVING & CONDITIONING ASSOCIATION, INC.

2159 GUARDIAN BUILDING **DETROIT 26, MICHIGAN**

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Acme Equipment Company
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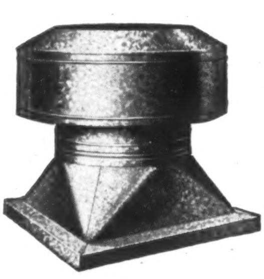
Swartwout Roof Ventilators

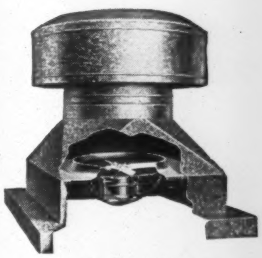
for every industrial, commercial and institutional need



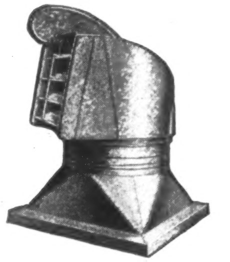
Gravity Valvent

The Swartwout Line of gravity and powered roof ventilators and ventilating louvers provides a wide range of facilities for handling vitally necessary ventilation. Experienced engineers are at your service to assist in the proper solution of your building interior atmospheric problems.

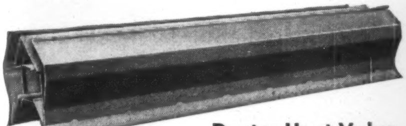
Write for Bulletin 352 — a condensed catalog describing all Swartwout Ventilators. Or refer to this item as filed in Sweet's Architectural File or Industrial Construction File.



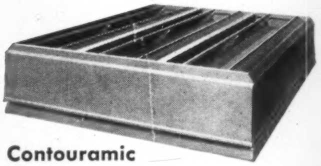
Powered Valvent



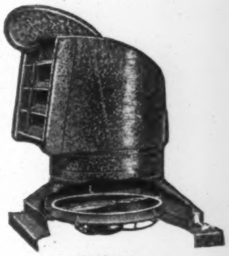
Rotary



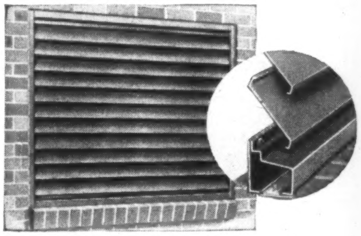
Dexter Heat Valve



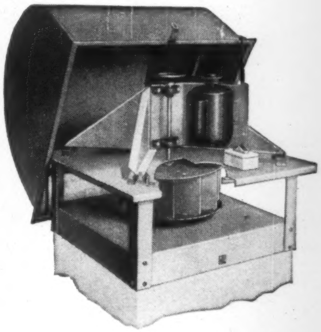
Contouramic Airmover



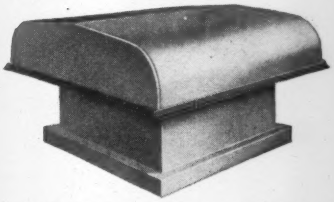
Airjector



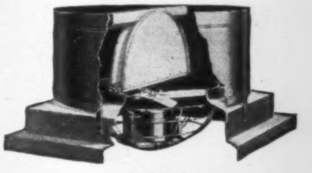
Louvers Swartwout Airlouvers are weathertight. Overlapping blades, fixed or adjustable. Unusual size range — fill any opening with equal size louver units.



Airlift (duct exhaust)



Low Line — Gravity & Powered



Whirlout

Fire Ventilation

Swartwout Fire Valve is designed to quickly release smoke, heat and fumes in case of fire, helping to prevent fire spread. It is an approved type of heat release for school and theater stages. Each unit provides 46 sq. ft. free opening. Weatherproof when closed.

Fire Valve

Swartwout

Industrial Ventilating Specialists

THE SWARTWOUT COMPANY • 18511 Euclid Ave., Cleveland 12, Ohio

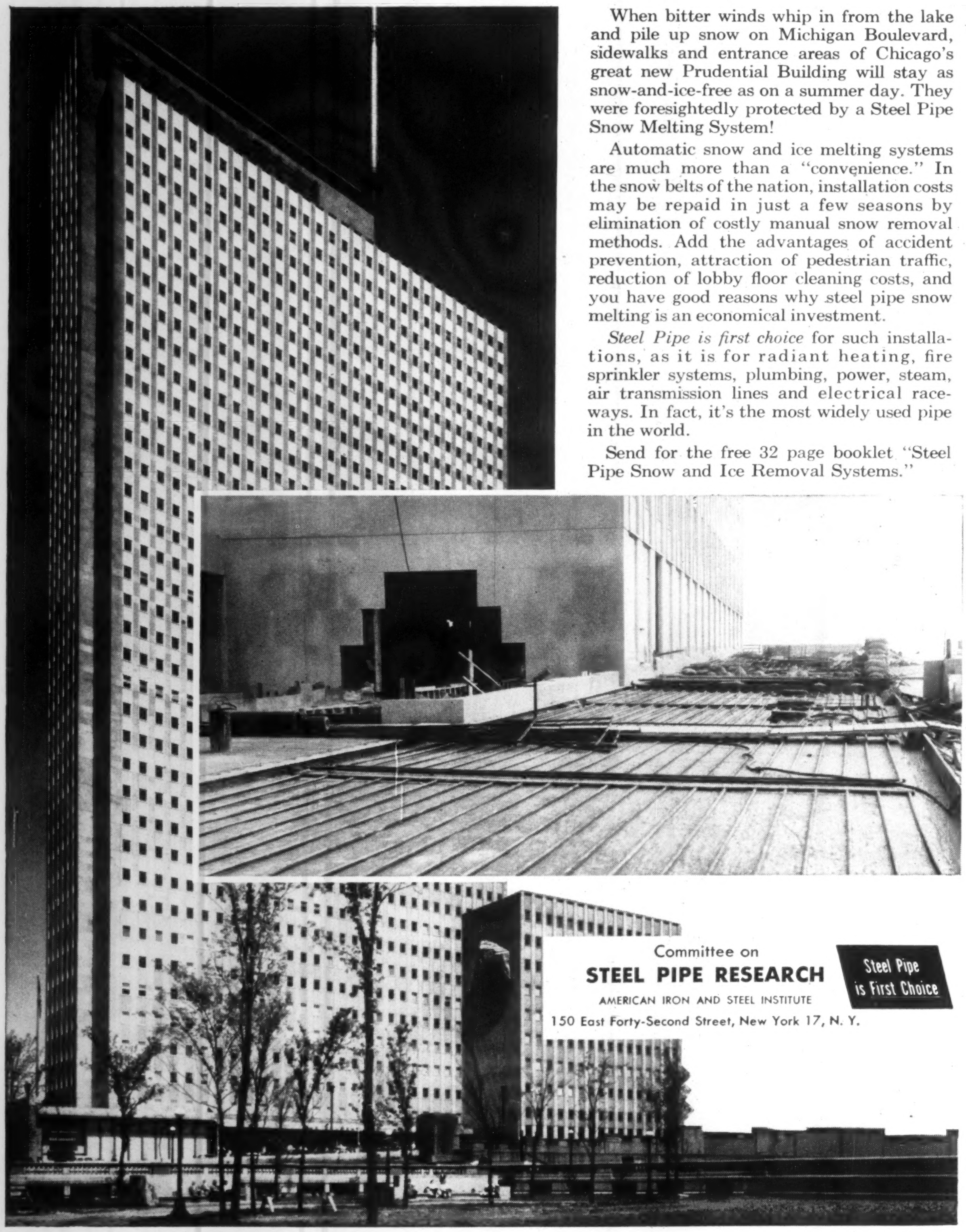
PRUDENTIAL INSURES SNOWLESS SIDEWALKS WITH A STEEL PIPE MELTING SYSTEM

When bitter winds whip in from the lake and pile up snow on Michigan Boulevard, sidewalks and entrance areas of Chicago's great new Prudential Building will stay as snow-and-ice-free as on a summer day. They were foresightedly protected by a Steel Pipe Snow Melting System!

Automatic snow and ice melting systems are much more than a "convenience." In the snow belts of the nation, installation costs may be repaid in just a few seasons by elimination of costly manual snow removal methods. Add the advantages of accident prevention, attraction of pedestrian traffic, reduction of lobby floor cleaning costs, and you have good reasons why steel pipe snow melting is an economical investment.

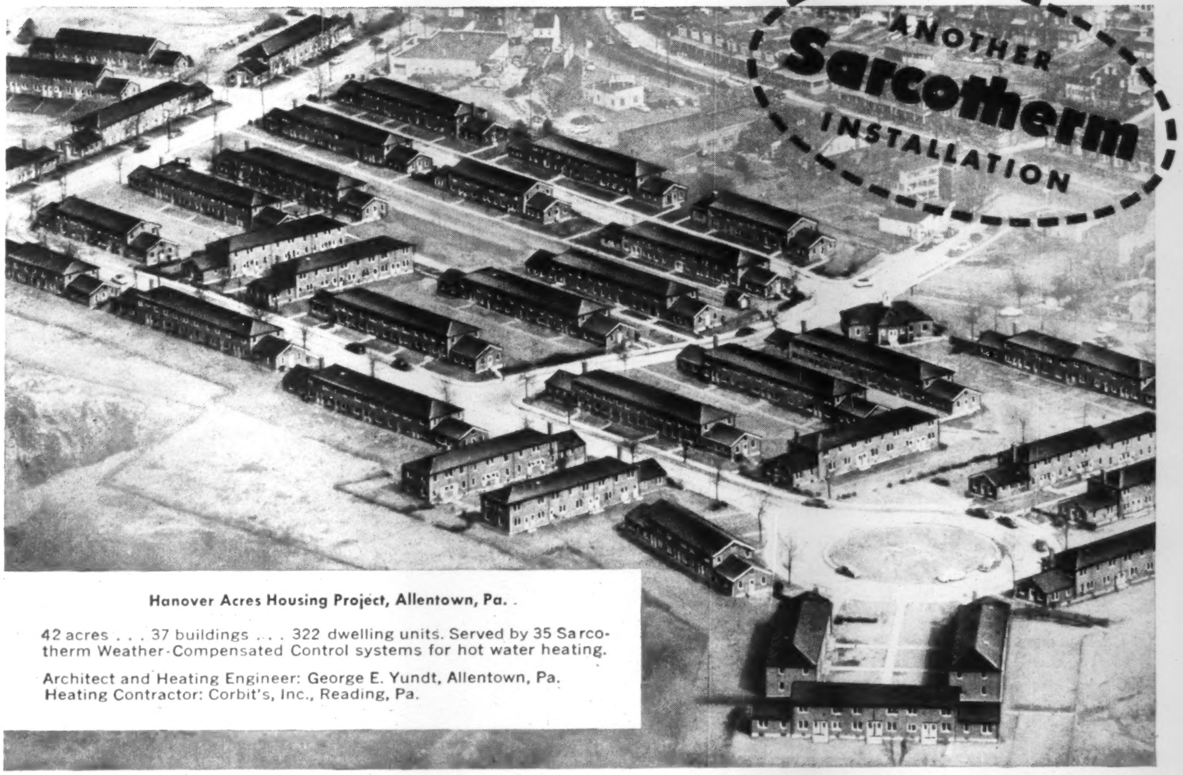
Steel Pipe is first choice for such installations, as it is for radiant heating, fire sprinkler systems, plumbing, power, steam, air transmission lines and electrical raceways. In fact, it's the most widely used pipe in the world.

Send for the free 32 page booklet "Steel Pipe Snow and Ice Removal Systems."



Committee on
STEEL PIPE RESEARCH
AMERICAN IRON AND STEEL INSTITUTE
150 East Forty-Second Street, New York 17, N. Y.

Steel Pipe is First Choice



Hanover Acres Housing Project, Allentown, Pa.

42 acres . . . 37 buildings . . . 322 dwelling units. Served by 35 Sarcotherm Weather-Compensated Control systems for hot water heating.

Architect and Heating Engineer: George E. Yundt, Allentown, Pa.
Heating Contractor: Corbit's, Inc., Reading, Pa.

42 acres of comfortable heating ...for 16 years!

Provided by 35 Sarcotherm Weather-Compensated Control Systems

Here's the Test...35 Sarcotherm Systems...16 years on the job...serving 322 dwelling units at Hanover Acres Housing Project, Allentown, Pa. That's a tough test of heating control dependability and economy!

And here's the Result!...The Housing Authority of the City of Allentown reports...throughout the entire 16 years these Sarcotherm Weather-Compensated Control Systems for hot water heating have given trouble-free service and provided money-saving, comfortable heating.

Dependability-plus...that's one of the major reasons Sarcotherm Systems have been installed in many important projects including Hanover Acres and Beardsley Terrace Housing, Bridgeport, Connecticut.

For undivided responsibility on your installations, specify and order from one "Complete Line" source...SARCO-SARCOTHERM.

Write for catalogs. Sarcotherm Controls, Inc., Empire State Building, New York 1, N. Y.

ADVANTAGES OF SARCOTHERM SYSTEMS

On-the-job help—Sarcotherm engineers cooperate in preparing working drawings and wiring diagrams for each job. Also assist in supervising the installation.

Easy to maintain—simple, trouble-free design, fewer parts.

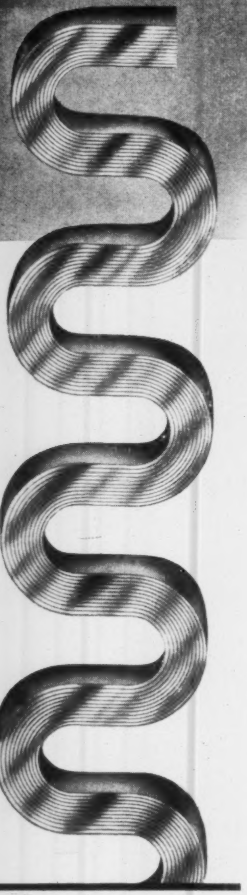
Easy to adjust—to any desired setting.

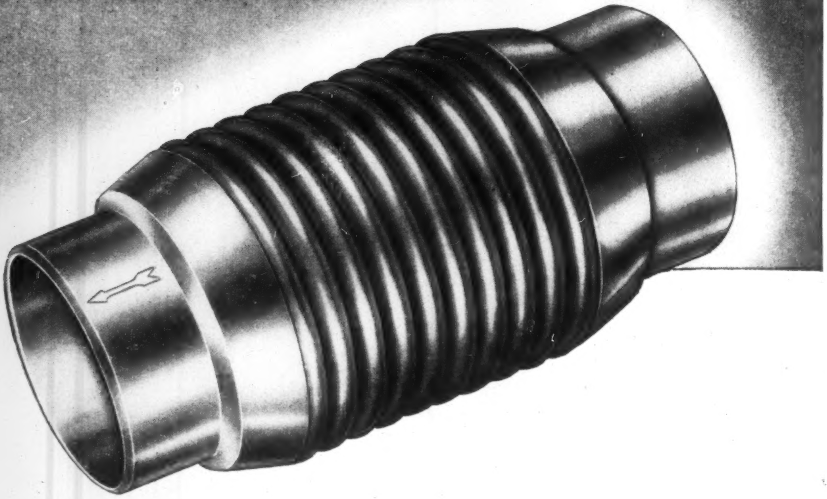
Complete Control Systems from Sarcotherm include all accessories such as control panels, thermostats, radiator valves, balancing fittings, steam traps, domestic hot water controls, etc.

4008-B

Sarcotherm
AN AFFILIATE OF SARCO CO., INC.
Weather-Compensated control systems for steam, hot water and radiant heating

New MULTI-PLY EXPANSION JOINT gives greater ELASTICITY

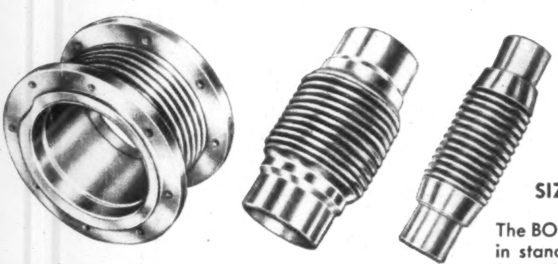




Here's an expansion joint that's really different—it's the BOA expansion joint with the exclusive patented multi-ply corrugated element. Its greater elasticity, flexibility and longer life is the result of the superior cold-forming properties of extremely light-gage stainless steel strip. This "layer on layer" construction of the corrugated element resulting in low reaction to mechanical forces, permits greater responsiveness to expansion and contraction.

For your next piping job, investigate this superior product of Swiss engineering and see for yourself.

Write today for detailed and descriptive literature.



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If you are a distributor or contractor, — ask us about some of the exclusive territories still open.

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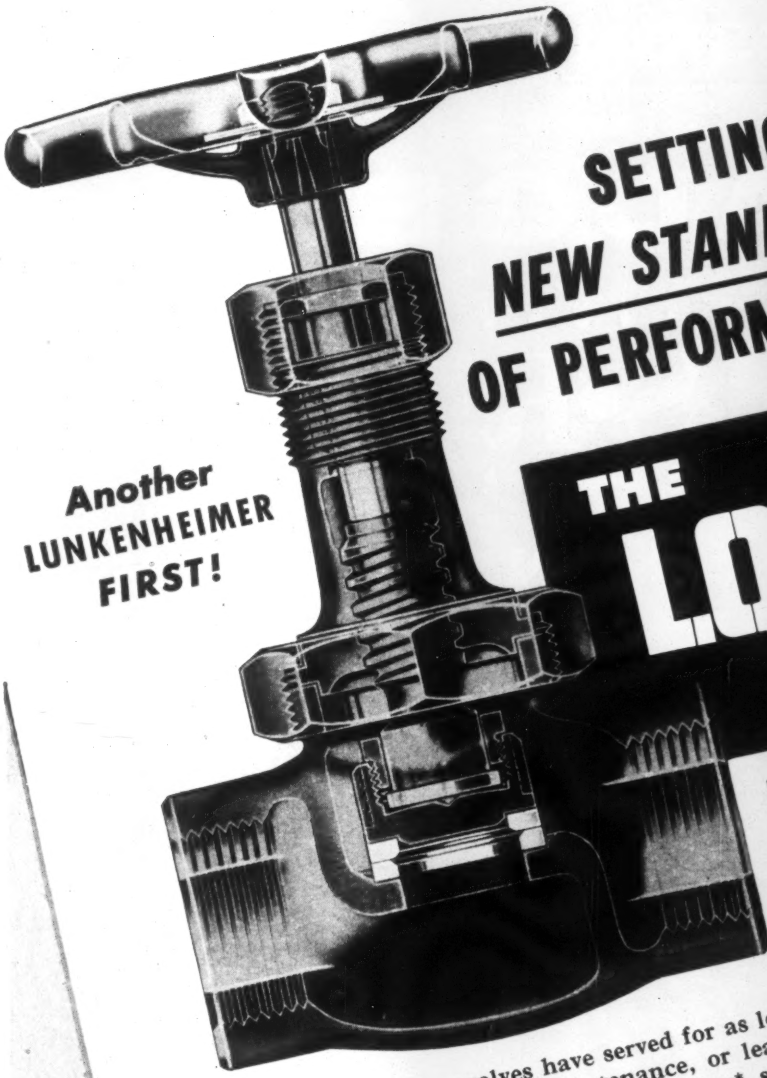
SIZES

The BOA multi-ply is made in standard sizes ranging from 1 ½" to 24" for pressures to 400 psi. Others specially engineered for higher pressures and temperatures.

AMERICAN BOA multi-ply INCORPORATED

114 Liberty Street
New York, N. Y.



SETTING NEW STANDARDS OF PERFORMANCE...

Another LUNKENHEIMER FIRST!

THE LQ600 VALVE

FIG. LQ600-200
200 lb. S.P.—400 lb. W.O.G.
550° F.

FIG. LQ600-150
150 lb. S.P.—300 lb. W.O.G.

¼ to 2 inches

Thousands of these valves have served for as long as five years without replacement, regrinding, maintenance, or leakage—even on the most severe services. Their patented Brinalloy* seats and discs are more resistant to wear and corrosion than 500 Brinell Stainless Steel . . . even outlast case-hardened Stainless Steel exceeding 1000 Brinell. LQ600 Valves practically eliminate maintenance costs!

*Patented Alloy—T. M. Reg.

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L-456-28

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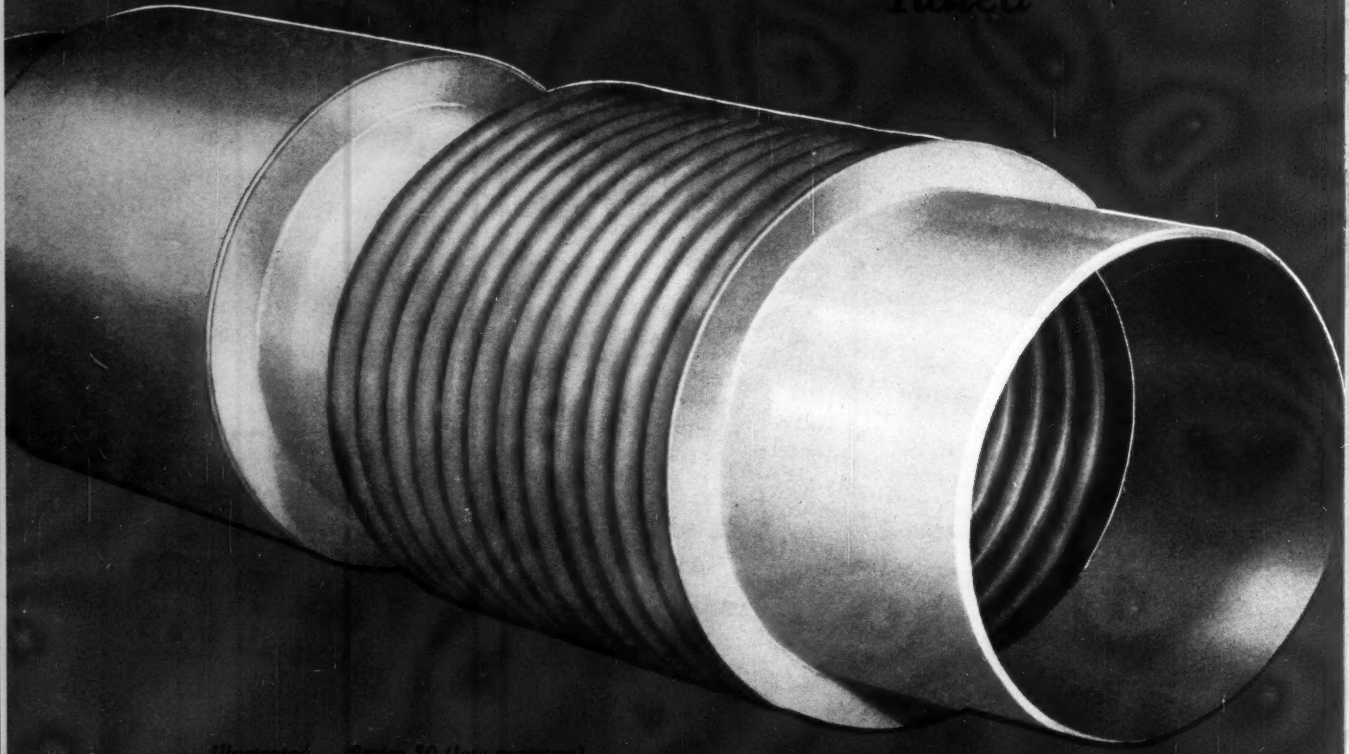
BADGER

S·R*

EXPANSION JOINTS

* *Service-Rated*



Illustrated — Series 50 (low pressure) S-R Double Joint with welding ends. Cover removed from one bellows.

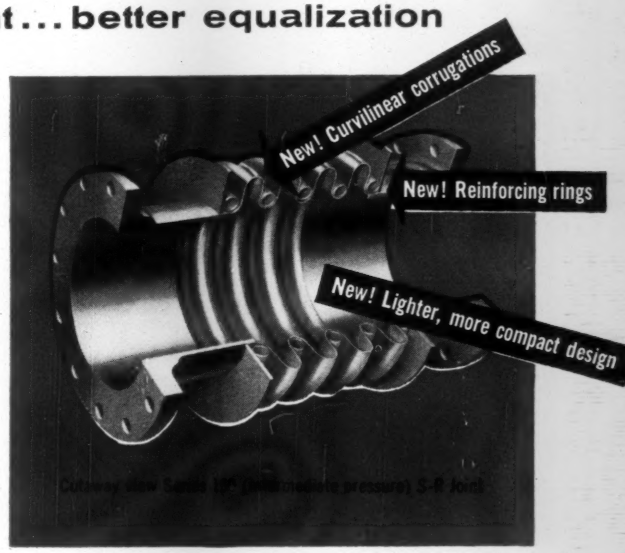
most experienced manufacturer

Revolutionary new design provides longer cyclic life . . . less weight . . . better equalization

Over three years of intensive research and testing have paid off! Badger S-R Expansion Joints — corrugated packless expansion joints of an entirely new design — are ready for your most exacting power, heating, industrial and process piping applications.

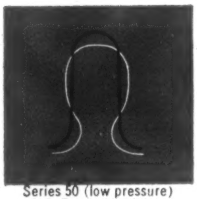
Two significant features of the new joints are 1.) Curvilinear Corrugations, which result in natural "all-curve" flexing and equal distribution of movement among the corrugations; 2.) tubular Reinforcing Rings, which work with the new corrugations to produce greater effective flexing height and "all-curve" flexing even under higher pressures and temperatures.

And there are other important features, too . . . size for size, Badger S-R Joints weigh up to 50% less than conventional types . . . new ring design reduces joint diameter . . . a complete line of accessories — including covers and liners — are available . . . standard models in stainless, monel and inconel, special types in any workable alloy.


New! Curvilinear corrugations
New! Reinforcing rings
New! Lighter, more compact design

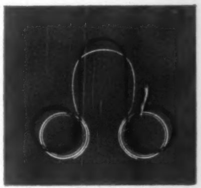
Cutaway view Series 150 (intermediate pressure) S-R Joint

New corrugation and ring designs produce better equalization, "all-curve" flexing



Series 50 (low pressure)
S-R Expansion Joints

The radically different Curvilinear Corrugations used in Badger S-R Expansion Joints were developed by the Badger Research Department. As shown in the cross-section of a Series 50 Joint (left), the design produces more uniform movement per corrugation and flexing to a natural "all-curve" shape, which results in lower stresses and therefore increased life. (White line in diagram shows the efficient "all-curve" shape the corrugations *naturally* assume under operating pressures.)



Series 150 (intermediate pressure) S-R Expansion Joints

Series 150 S-R Joints feature Curvilinear Corrugations and, because they are used at higher pressures, also have tubular Reinforcing Rings. A significant engineering improvement, these new rings make metal-to-metal contact only in the "valley" of each corrugation yet allow natural "all-curve" flexing (white line) when the pipeline is subjected to pressure. The tubular shape of the rings also permits greater effective flexing height and therefore contributes to longer joint life.

Learn more about ways S-R Joints can be of advantage to you . . .

New illustrated brochure describes them in detail — mail coupon for your free copy today.

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EXPANSION JOINTS
from the world's most experienced manufacturer
NEW DESIGN

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230 Bent Street
Cambridge, Massachusetts

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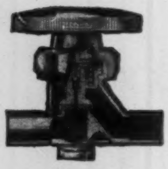
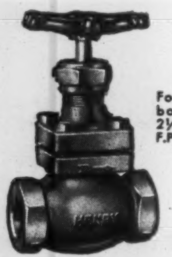
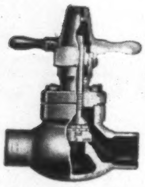


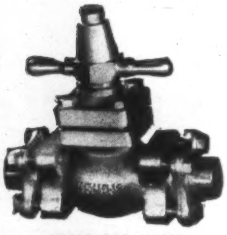
PACKLESS VALVE
With balanced-action. Sizes ¼" through ⅝" Fl., ¼" through 1⅝" O.D.S.



AMMONIA VALVE
Forged steel or semi-steel bodies. Sizes ¼" through 2½" F.P.T., 1¼" through 6" F.P.T. slip-on welding or welding neck flanges.



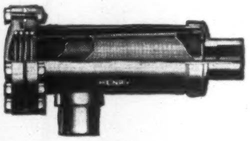
WING CAP VALVE
Non-ferrous. Sizes ⅞" through 4⅛" O.D.S.



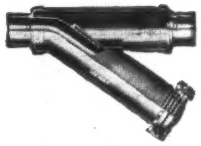
WING CAP VALVE
Semi-steel screwed or flanged types. Sizes 1¼" through 6".

HENRY VALVE CO.
CONTROLLING FLOW

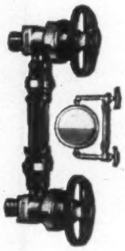
you pay— *no premium for..* the extra advantages found in *Henry products* or for the extra satisfaction that follows their use



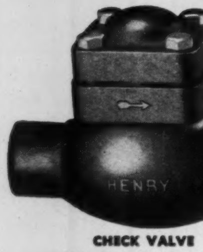
STRAINER
Angle type with patented distortion-type flange. Sizes ⅜" through 4⅛" O.D.S., 2½" through 4" butt weld.



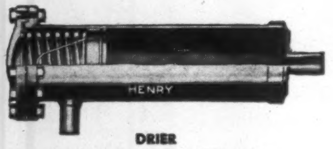
Y-STRAINER
Brass plated. Welded steel construction. Forged brass connections. Sizes ⅝" through 4⅛" O.D.S., 2½" through 4" butt weld.



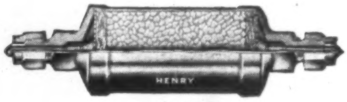
BALANCED-ACTION PACKLESS LIQUID LEVEL GAUGES
Valves are backseating—diaphragms may be inspected or replaced without loss of liquid. Conforms with all safety code requirements. Also packed types, capped or with hand wheels.



CHECK VALVE
Piston Type For Freon. Sizes ⅞" through 4⅛" O.D.S.



DRIER
Cartridge type 12 to 500 cu. in. capacity. Sizes ⅜" to 2⅛" O.D.S



DRIER
Large diameter and capacity. All brass construction. Minimum pressure drop.

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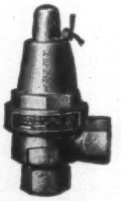
No. 101 Packless and packed valves, strainers, driers, check valves, relief valves, three-way valves, liquid gauge sets, flange unions and accessories for air conditioning, refrigeration and industrial uses.

No. 201 Ammonia valves and accessories.

No. 72 Drop forged and cold rolled steel fittings.



DIAPHRAGM RELIEF VALVE
Operates independently of outlet pressure permitting use of rupture disc assembly on outlet side without increasing initial leak pressure. Forged brass bodies. Sizes, ⅜" & ½" I.P.S., ⅝" & ⅞" O.D.S.

UV NB

STRAIGHT-THROUGH RELIEF VALVE
Large capacity—All brass construction. Sizes ½" through 1" P.T. Meet A.S.M.E. standards, National Board Certified. Other sizes and types available.

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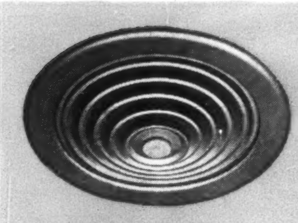
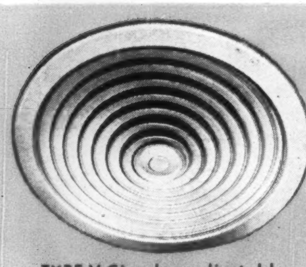
HENRY VALVE COMPANY

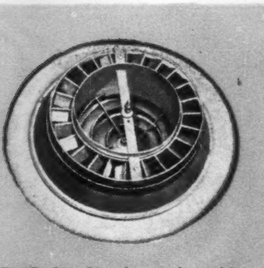
MELROSE PARK, ILLINOIS Chicago Suburb • Cable: HEVALCO, MELROSE PARK, ILLINOIS



TYPE R Circular, adjustable volume, constant pattern and radius of diffusion.

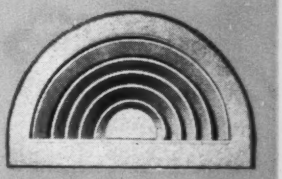


TYPE V Circular, adjustable volume and pattern, for heating and cooling.



TYPE CH Circular, adjustable supply and return, for heating and cooling.

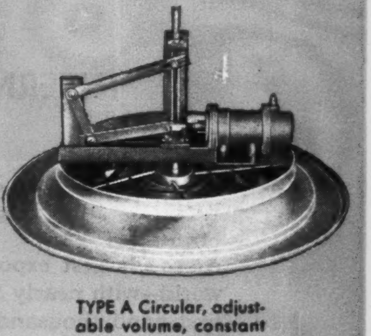
a model for every diffuser need FLEXIFLO



TYPE S Half-round, for side wall or ceiling, for heating or cooling.

- CIRCULAR
- SQUARE
- RECTANGULAR
- ADJUSTABLE
- AUTOMATIC

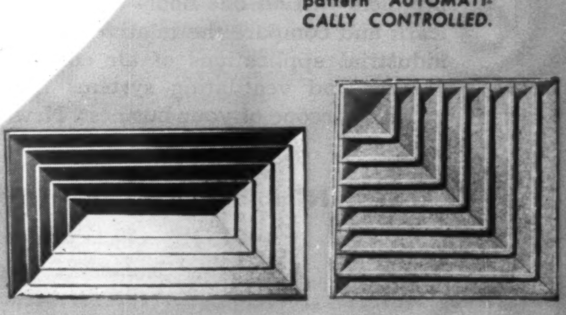
All FLEXIFLO diffusers are styled simply, beautifully . . . finished in baked enamel of any desired color . . . extra features include built-in equalizing deflectors . . . simple, easy installation and removal of diffuser cores with just a "twist of the wrist."



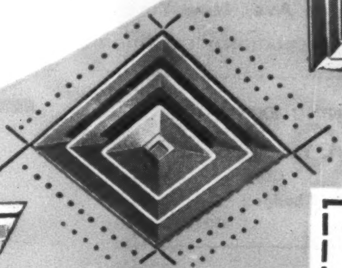
TYPE A Circular, adjustable volume, constant pattern *AUTOMATICALLY CONTROLLED.*

A COMPLETE LINE OF DIFFUSER ACCESSORIES

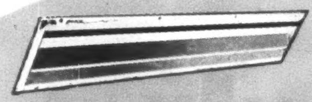
Let a trained FLEXIFLO sales engineer help you solve your air distribution problem. Representatives in major cities throughout the U.S. and Canada.



TYPE MP Rectangular, for one, two, three or four-way diffusion, 16 styles, hundreds of sizes to accommodate any shaped area.



TYPE H Square, adjustable volume, *constant pattern and radius of diffusion.*



TYPE MPL Long strips of any length, for one- or two-way diffusion.

UNIVERSAL DIFFUSER CORP.
38 Marbledale Road, Tuckahoe, N. Y.

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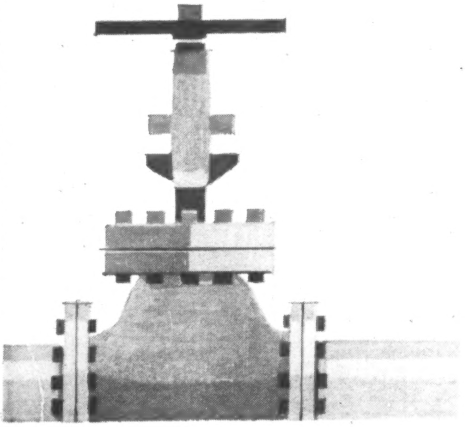

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Dust Collecting Equip.
Electric Heaters
Ducts & Fittings
Evaporators
Fan Blades

Fans
Filters
Flue Gas Analysers
Fuels
Furnaces
Gas Burners
Governors
Grilles
Hangers
Heat Exchangers
Heat Surface
Heating Systems
Heat Pumps
Humidifiers
Hygrometers
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Radiators
Refractories
Refrigerants
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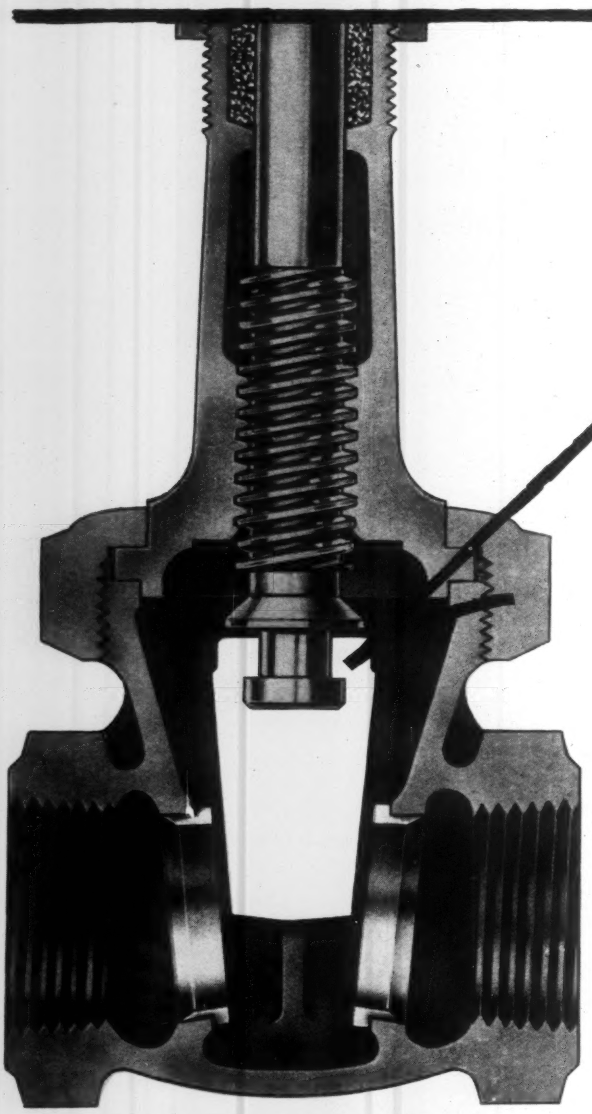
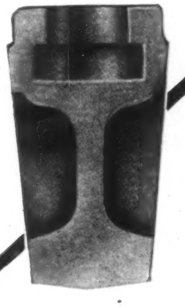
In JENKINS *Monel-seated Bronze Gates*

THE WEDGE TAKES THE WEAR - *and spares the rings*





Easy replacement of the wedge only — right on the line — restores full efficiency

THE MONEL SEAT RINGS are expanded into the body to assure a positive, leak-proof joint. Exhaustive tests in typical monel-seated gate valve services show that this permanent all-around support of the rings is essential to guard against deforming, loosening, or shifting.

THE RENEWABLE WEDGE (bronze or nickel alloy) has excellent wear resistance, but has a lower degree of hardness than the heat-treated Monel rings, which have optimum resistance to erosion and corrosion as well as abrasion. Thus, wear of the wedge leaves the rings relatively unaffected. When necessary to renew the wedge, you simply remove the valve bonnet, slip the old wedge off the stem, and slip on a new one.

GET PRACTICAL, LOW-COST RENEWABILITY in the valves you choose for the tough, punishing services that require Monel-seated gates. Compare . . . there is nothing simpler, faster, or more economical than Jenkins replaceable wedge design — and you also get the *plus* of Jenkins *extra value* in every other feature. Jenkins Bros., 100 Park Ave., New York 17, New York.

MADE WITH BRONZE OR NICKEL ALLOY WEDGE

The bronze wedge provides lasting economy for most applications. The nickel alloy wedge provides extra resistance where rapid wear and corrosion are factors.

JENKINS BRONZE GATES WITH MONEL SEAT RINGS

200 psi	300 psi
Fig. 270-U, Bronze Wedge	Fig. 280-U, Bronze Wedge
Fig. 270-UN, Nickel Alloy Wedge	Fig. 280-UN, Nickel Alloy Wedge
Fig. 270-UL, Bronze Wedge, U.L. approved for L.P.G. Services	**350 psi** Fig. 280-UX, Bronze Wedge

JENKINS BRONZE GATES INCLUDE 40 DIFFERENT PATTERNS

125 • 150 • 200 • 300 • 350 psi SOLID WEDGE • SPLIT WEDGE
SCREWED • FLANGED • SOLDER END • SOCKET END QUICK OPENING

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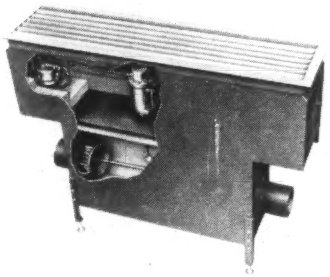
VALVES
SINCE 1864 TRADE JENKINS MARK
Jenkins Bros

EQUIPMENT DEVELOPMENTS . . .

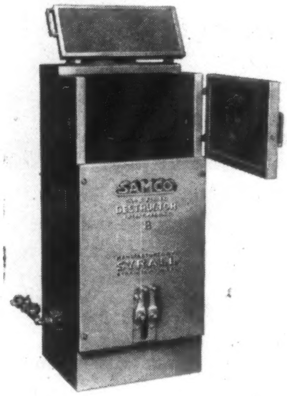
For reviews of Recent Trade Literature see Page 306



Air Conditioning . . .

. . . system with new method of introducing constant volume of conditioned air into rooms, offices, other spaces—*Anemostat Corp. of America, Dept. HPAC,* 10 *E. 39th St., New York* 16.

Method is said to make volume control automatic, continuous. Used with high velocity, dual duct air conditioning systems. Hot and cold air are brought by separate ducts to attenuator box. Entry of air into box controlled by rocket socket valves. Degree of opening of hot or cold valves controlled by thermostat and pressure sensitive membrane acting through system of linkages. Is said to provide very close control of air volume.



Incinerator . . .

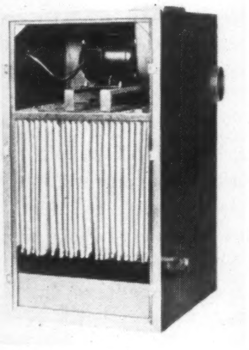
. . . designed for rapid disposal of wet, dry combustibles in large buildings—*Syrall Mfg. Co., Dept. HPAC,* 511 *N. State St., Syracuse* 3.

"Samco No. 8" gas fired "crematory" type unit has 8 bu capacity weighing close to 1000 lb. Portable unit designed for rapid burning with 150,000 Btu input. Burner assembly consists of 2 hr timer, pilot burner, safety valve.

Blower Wheel . . .

. . . engineered to answer need for higher speeds in air conditioning equipment—*Lau Blower Co., Dept. HPAC,* 2001 *Home Ave., Dayton* 7, *Ohio.*

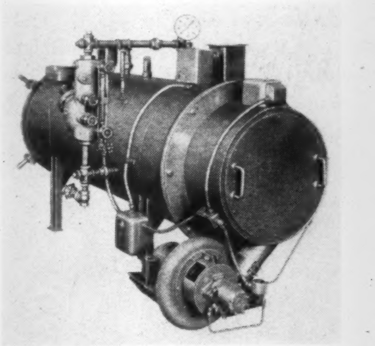
"Preslock" designed to operate at maximum of 1500 rpm against 2 to 3 in. static pressure. Cited features: new smooth air flow center disc design to reduce turbulence, increase efficiency; wider spread between hubs to increase lateral stability; new positive mechanical lock to secure each blade to center discs.



Dust Collectors . . .

. . . redesigned to permit increased dust storage capacity—*Torit Mfg. Co., Dept HPAC,* 287 *Walnut St., St. Paul* 2.

Each of three models has 150 sq ft cloth filtering area. Internally mounted motors, fans move 580 to 1100 cfm of air through filter at speeds 5000 to 8000 fpm, says company. Units have manual starter with overload protection, foot pedal for shaking filters "clean," steel cabinets, inside exhaust (where regulations permit).



Steam Generators . . .

. . . with packaged construction, in 10 or 15 hp models—*York Shipley, Inc., Dept. HPAC, York, Pa.*

For firing by either light oil or gas, or combination. Both units have 49 sq ft heating surface. Are available for high pressure service only. Units are of two-pass construction, which requires no baffle to divert flow of combustion gases. Maximum pressure is 125 psig.

Gas Burning Engines . . .

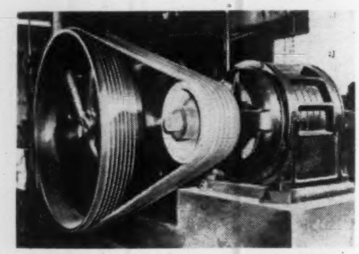
. . . for powering central air conditioning equipment—*Le Roi Div., Westinghouse Air Brake Co., Dept. HPAC, Milwaukee* 1.

Are said to provide up to 50 percent savings in operating costs. Units range 75 to 500 hp. Can be purchased in multiple units. For installation in new or renovated shopping centers, department stores, office buildings, theaters, hospitals, similar buildings using large size air conditioning equipment.

Room Air Conditioners . . .

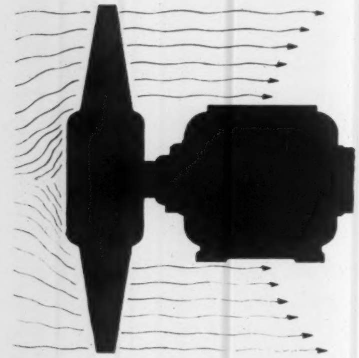
. . . in 1957 models—*O. A. Sutton Corp., Dept. HPAC* 1812 *W. Second St., Wichita* 2, *Kan.*

"Vornado" line includes: "Twin-Thin" units which can be mounted in upper sash, lower sash, through the wall, flush inside and are available in 1, 1½ hp models; "Deluxe" models that can be operated on 115 volts and include features such as flush mounting, single dial control, thermostat, exhaust, chemical air purifier and come in ½, ¾, 1, 1½ hp units; 2 hp model redesigned with size reduced one-third; casement window units in ½, ¾ hp models.



V-Belt . . .
. . . designed for applications where increased power transmission is desired with minimum of maintenance on multiple v-belt installations—*Thermoid Co., Dept. HPAC,* 200 *Whitehead Rd., Trenton, N.J.*

Available for all standard sizes, "Powerflex Hi-Capacity" unit features special oil resistant cover to prolong belt life, says company. Belts are said to have added strength which means fewer belts, narrower sheaves required to handle a load. Can be furnished with static conducting covers.

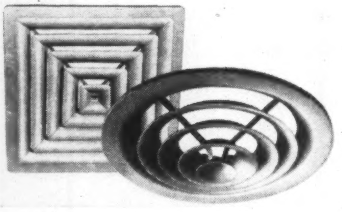


Axial Flow Fans . . .
. . . with aerodynamic construction—*Chicago Blower Corp., Dept. HPAC,* 9863 *Pacific Ave., Franklin Park, Ill.*

Design feature is in blades which closely resemble aircraft wings in appearance, says company. Wider blades are said to offer higher pressure characteristics with less operating noise. Units available with two, four, six, eight blades. Diameters range 12 to 72 in. Air moving capacities are 1200 to 100,000 cfm.

PVC Pipe . . .
. . . now available in all standard pipe sizes ¼ to 6 in.—*Easton Plastic Products Co., Inc., Dept. HPAC, Easton, Pa.*

Rigid unplasticized polyvinyl chloride pipe formulated to resist corrosion, most chemicals. Is also said to have desirable mechanical, dielectric properties. Protects against corrosive liquids, fumes, moisture, atmospheric conditions, says company.

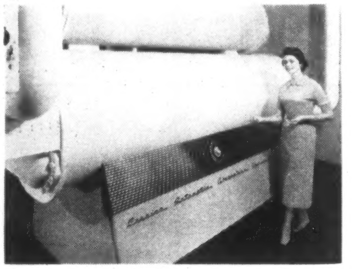


Ceiling Diffusers . . .
. . . in round, square step-down models—*Auer Register Co., Dept. HPAC,* 6600 *Clement Ave., Cleveland* 5.

Designed for fast, economical installation. Four screws hold diffuser, built-in damper to duct. Spring-loaded "Balancing Bell" damper permits easy system balancing, full shut-off without quadrant dampers, says company. Step-down vanes engineered to provide effective air distribution pattern.

Iron Powder Electrode . . .
. . . for field construction work, pipe line welding, tanks, fired and unfired pressure vessels, steel casting repairs—*Metal & Thermit Corp., Dept. HPAC, Rahway, N.J.*

"Murex Speedex R" is said to be first iron powder formulation offered in AWS E-6010 class. Is especially suitable for welds on machinery parts, many low alloy high tensile steels to ¼ in. thick, says company.

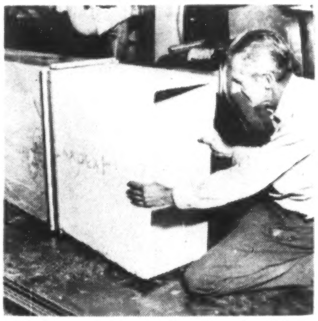


Absorption Cooling . . .
. . . units for stores, small office buildings, light manufacturing concerns—*Carrier Corp., Dept. HPAC, Syracuse* 1.

Two new smaller 60 and 80 ton sizes added to line previously available in range 100 to 700 tons. Units designed to use heat energy to produce cooling. Have no moving parts. Use water as refrigerant.

Sprocket Rims . . .
. . . designed for easy opening, closing of high overhead or otherwise awkwardly or inaccessibly located valves—*Babbitt Steam Specialty Co., Dept. HPAC, New Bedford, Mass.*

Now available cast in ductile iron. Equipped with chain guide, can be operated from floor easily and safely, says company.



Duct Lining . . .
. . . designed to cut installation costs, provide effective insulation against heat and sound—*Insul-Coustic Corp., Dept. HPAC,* 42-23 54*th Rd., Maspeth* 78, *N.Y.*

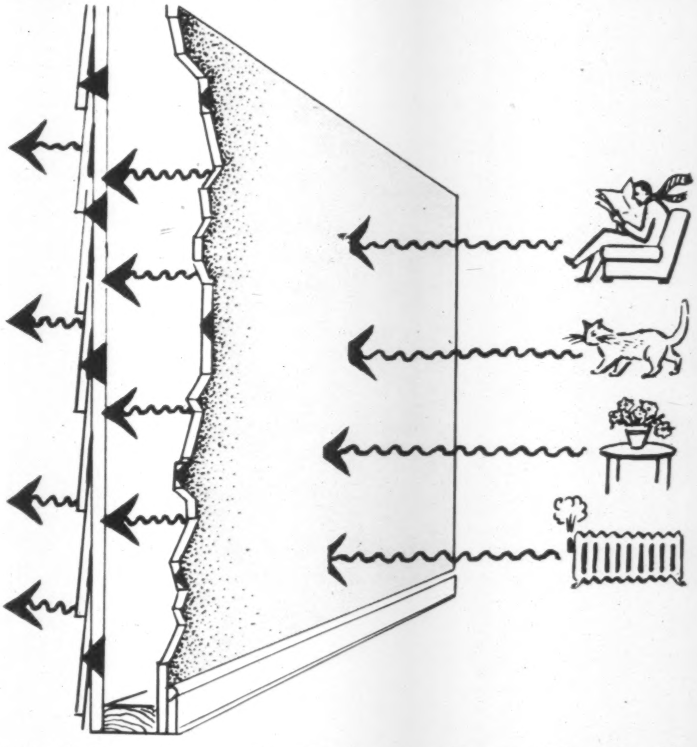
Molded fibrous glass line preformed at factory to fit rectangular or circular ducts in variety of sizes, thicknesses in 4 ft lengths. Is said to be lightweight, easy to handle. Is quickly inserted into duct, says company. Has k factor of 0.25 at 75 F mean temperature.

Ever Feel a "Draft" in a Warm, Closed Room?

(RADIATION is the transmission through space of invisible heat rays. They have no temperature, only energy. When absorbed by a surface, their energy is transformed to HEAT. The surface of any object warmer than absolute zero—the Sun, You, Clothing, Wood, Plaster, an Iceberg, a Stove, a Chair, Paper, an Animal, will RADIATE to a colder surface.)

(CONDUCTION is the process by which a cooler object or particle is heated by direct physical CONTACT with a warmer one.)

(CONVECTION is the transfer of heat within air caused by the flow of the air itself.)



People often complain of "drafts" in a room with air-tight walls and windows. Why? To a large extent because, by Nature's law, warmth flows to cold by RADIATION as well as by CONDUCTION. Cold walls, too, draw heat out of contacting air by conduction, causing a downward current of cold air.

The exposed skin of people and the outer surfaces of their clothing lose heat as infra red heat rays flow from them with 90% emissivity to a cooler wall surface which has 93% absorptivity (and transforms the heat rays again to heat). If insulation is lacking, or has settled down, most of this heat is transmitted by radiation to the colder outer wall with 93% emissivity, absorbed, and then dissipated to the colder, outer air. So people are uncomfortable, perhaps only in spots. More fuel is then burned.

Multiple layers of aluminum in the wall space would retard convection; turn back heat rays with 97% reflectivity. When plaster is sufficiently warm, no net heat loss radiates from bodies to it; no current of cold air flows along the wall's surface. Comfort is maintained without unduly high temperatures or fuel costs.

In summer, the process is identical except for direction. Heat flow by radiation, conduction and convection is retarded by the multiple sheets of aluminum in the outer wall space. Interiors of rooms stay cooler, and the plaster surfaces are also often cooler than the body. Some heat would then *leave* the body for the colder wall surfaces, increasing body coolness and comfort.

You'll enjoy, as well as profit from reading Alexander Schwartz's recently published manual: "Heat Flow by Radiation in Buildings, Simplified Physics." The scientific background of heat flow, specific information on how to control it, data on the various types of multiple aluminum insulation, ratings of insulation performance, and installation techniques under many conditions are interestingly discussed in this liberally illustrated 48 page manual. A FREE copy is yours for the asking.

THERMAL VALUES, INFRA TYPE 4S

Up-Heat	**C.105 = 3⅛" non-metallic insulation***
Wall-Heat	**C.068 = 4¾" non-metallic insulation***
Down-Heat	**C.042 = 7⅞" non-metallic insulation***

*Based on limiting values of Fed. Spec. HH-I-521c

Cost installed between wood joists, material and labor, about 8¢ sq. ft.

Type 6 also available

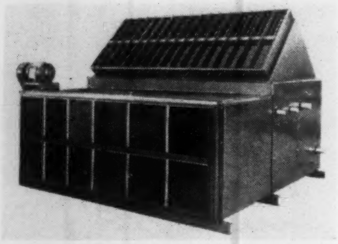
Can be purchased everywhere through your preferred local dealer.

Infra Insulation Inc., 525 Bway., N.Y.C., Dpt. H-1
Please send "Heat Flow by Radiation."

NAME

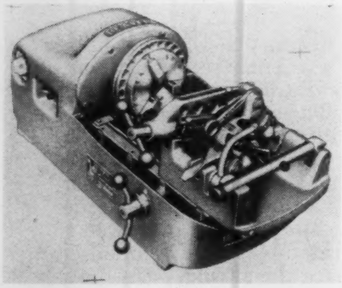
FIRM

ADDRESS



Air Conditioning Unit . . .
. . . for buildings where both heating, cooling are required simultaneously —*McQuay, Inc., Dept. HPAC,* 1600 *Broadway, N.E., Minneapolis* 13.

Central station type multizone unit designed to deliver to each zone either filtered, cooled, dehumidified air or filtered, heated, humidified air. In eight sizes ranging 1370 to 21,000 cfm. Each size has maximum number of zones varying 6 on smallest to 22 on largest. Available in horizontal or vertical models.

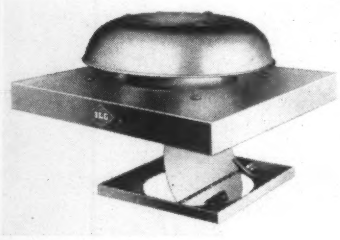


Pipe, Bolt Machine . . .
. . . with portable design—*Beaver Pipe Tools, Inc., Dept. HPAC, Warren, Ohio.*

"Speed-O-Matic" weighs only 170 lb, yet is fast, rugged, powerful, says company. Threads 1/8 to 2 in. pipe, 1/4 to 2 in. bolts, up to 12 in. with drive shaft. Cited feature is improved, fully protected motor. Company's "Power-Grip" wrenchless chuck included as standard equipment.

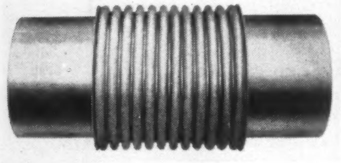
A-C/D-C Electrode . . .
. . . for high alloy steels—*Eutectic Welding Alloys Corp., Dept. HPAC,* 40-40 172*nd St., Flushing* 58, *N.Y.*

Available in 3/32, 1/8, 5/32, 3/16 in. diameters. Is said to produce joints with ultimate tensile strength to 120,000 psi. Deposits take high polish, says company. Recommended by manufacturer as replacement for conventional electrodes used on dissimilar alloy steels, highest tensile work where embrittlement must be avoided and for carbon, spring, tool and die steels. Is combination of company's "68 AC" and "680 DC" electrodes.



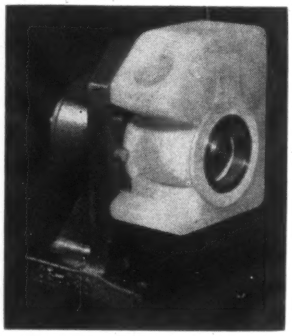
Roof Ventilators . . .
. . . in three new "low silhouette" sizes—*Ilg Electric Ventilating Co., Dept. HPAC,* 2850 *N. Pulaski Rd., Chicago* 41.

Models range in height 6¾ to 12¾ in. Recommended by company for modern institutional, commercial, industrial architectural requirements. Capacities range 287 to 938 cfm. Motors are shaded pole type, totally enclosed, with "permanently" lubricated bearings.



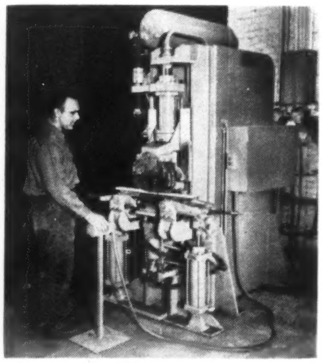
Expansion Joints . . .
. . . for use in power, heating, industrial and process piping applications —*Badger Mfg. Co., Dept. HPAC,* 230 *Bent St., Cambridge, Mass.*

"Service-Rated" units available in several types classified in series according to pressure, temperature conditions to be encountered. Redesigned corrugations to facilitate greater flexibility, more uniform movement per corrugation is cited feature of joints. Available in any weldable alloy, says company, for pipe diameters 3 to 72 in.



Pump . . .
. . . engineered for use with extremely corrosive fluids—*Vanton Pump & Equipment Corp., Dept. HPAC,* 201 *Sweetland Ave., Hillside, N.J.*

Fluids handled are in contact only with "Teflon" or "Kel-F," says company. Since shaft seals and stuffing boxes are eliminated in pump design, fluids or slurries are isolated in passage formed by outer surface of liner and inner surface of body block. Capacities available to 5 gpm with pressures to 50 psi.



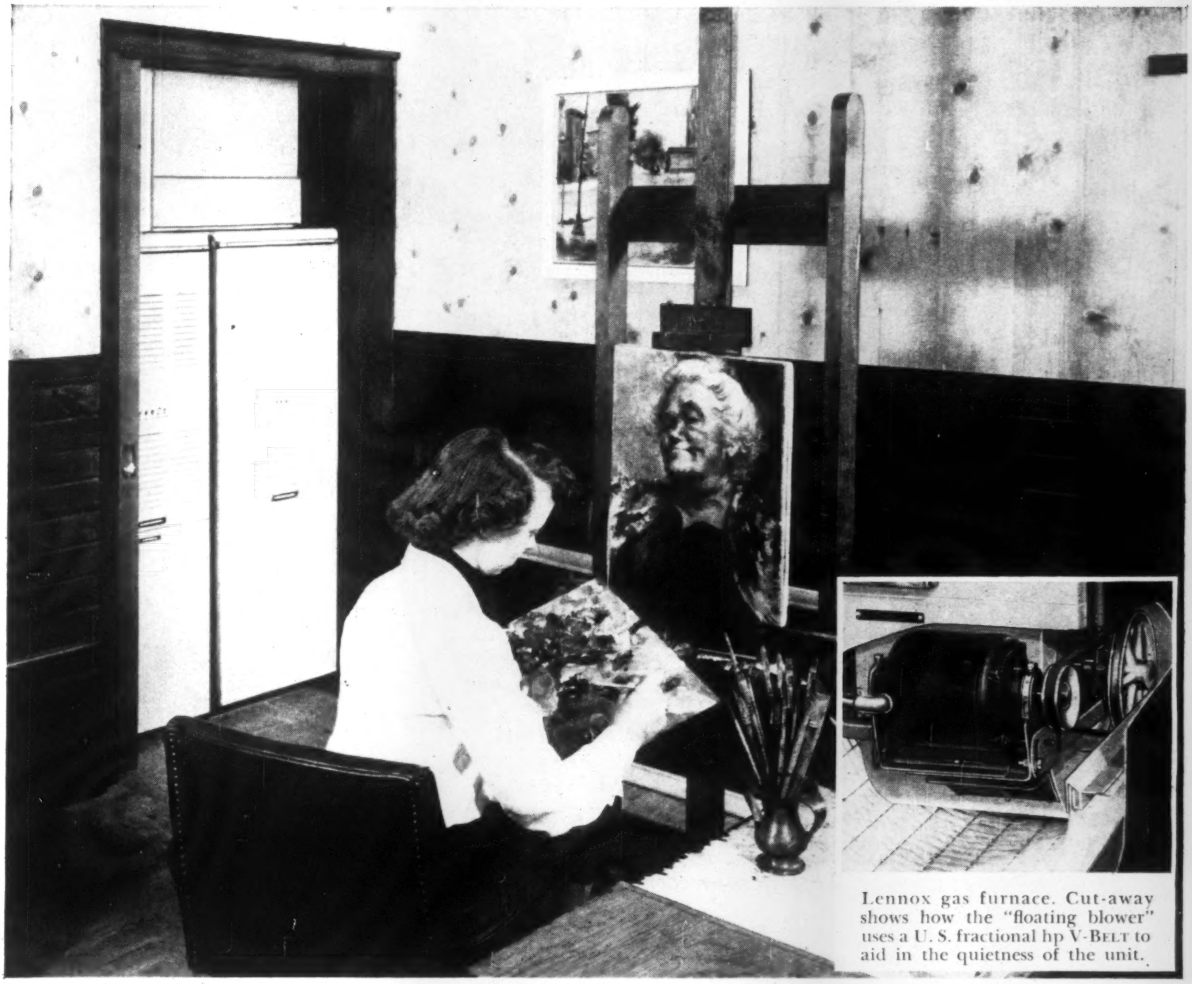
Tube Bending Press . . .
. . . designed to make four or more bends with each ram stroke, permit different angles in same "Q" frame —*Pines Engineering Co., Inc., Dept. HPAC,* 601 *Walnut St., Aurora, Ill.*

"Model 6-T" incorporates self contained hydraulic system built for continuous production. Rated capacity is 6 tons. Handles up to 1 in. OD steel tubing. Produces 1700 to 3000 bends per hr, says company.

Millivoltmeter . . .
. . . for checking voltage output of safety thermocouples on gas fired

V-Belts

selected by Lennox engineers for quiet operation



Lennox gas furnace. Cut-away shows how the "floating blower" uses a U. S. fractional hp V-Belt to aid in the quietness of the unit.

In the Lennox gas furnace, all vibrations are stopped dead. And because vibrations cannot possibly travel on, there's no chance of noise or rattle, not even a whisper.

The U. S. fractional hp V-Belt is a big reason.

This belt has two exclusive "U. S." developments—Electronic Tension and a new kind of molding process.

With the Electronic Tension technique each cord in the belt is built in by error-proof electronics, instead of by mechanical means. This guarantees every cord will pull its full share of the load. Belt life is prolonged.

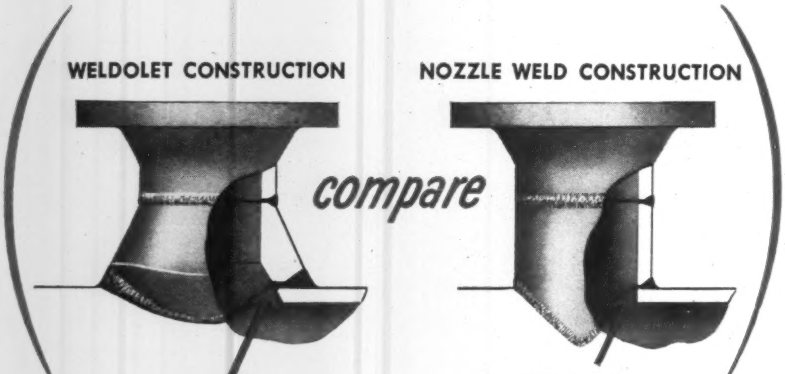
The new molding method provides a smooth contact jacket without high spots or surface imperfections . . . making U. S. fractional hp V-Belts ideal for appliances and high-precision machinery. It also gives U. S. fractional hp V-Belts outstanding resistance to wear, grime and moisture penetration.

Additional information on the U. S. fractional hp V-Belt may be obtained from any of the 28 "U. S." Sales Offices or from any of the select "U. S." Distributors. Or contact us at Rockefeller Center, New York 20, N. Y.

Mechanical Goods Division

United States Rubber

add → **years** to your piping
→ **gallons** to your flow
→ **strength** to an otherwise weak link
→ **BONNEY WELDOLETS**
to your piping drawings
for all branch connections



A STRONG LINK
adds years
gallons
strength
and assures a clean, properly fabricated and properly designed branch connection

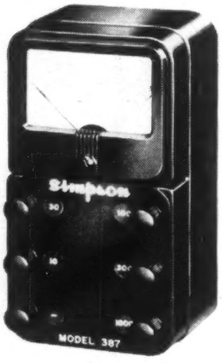
A WEAK LINK
for corrosion
external forces
internal pressure

Labor costs are now at an all time high. Reevaluation of your piping costs will now reveal Weldolets 4" and smaller to be less costly to fabricate than unreinforced nozzle connections. In the field this is also true of larger sizes and Weldolets are always more economical than branch connections made by welding tees or reinforced nozzles. Weldolets are manufactured in all sizes from 36" and all weights from xxs, in carbon steel, stainless, alloy, wrought iron and non-ferrous metals.

BONNEY
WELDOLETS ®
THREDOLETS ®
SOCKOLETS ®

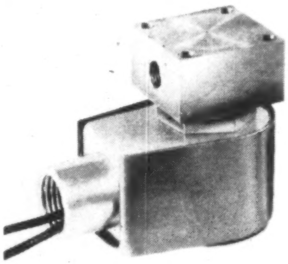
CARBON STEEL
STAINLESS
ALLOY
for all services

PENNSYLVANIA DIVISION
BONNEY FORGE & TOOL WORKS
ALLENTOWN, PENNSYLVANIA
DEPT. C



equipment—*Simpson Electric Co., Dept. HPAC, 5200 W. Kinzie St., Chicago 44.*

Pocket sized "Model 387" used by placing lead clips across thermocouple terminals. Ranges available are 10, 30, 100, 300, 1000 millivolts. Accuracy is 3 percent of full scale at ambient temperatures 50 to 120 F, says company. Unit includes pair of 48 in. leads. Carrying case available.



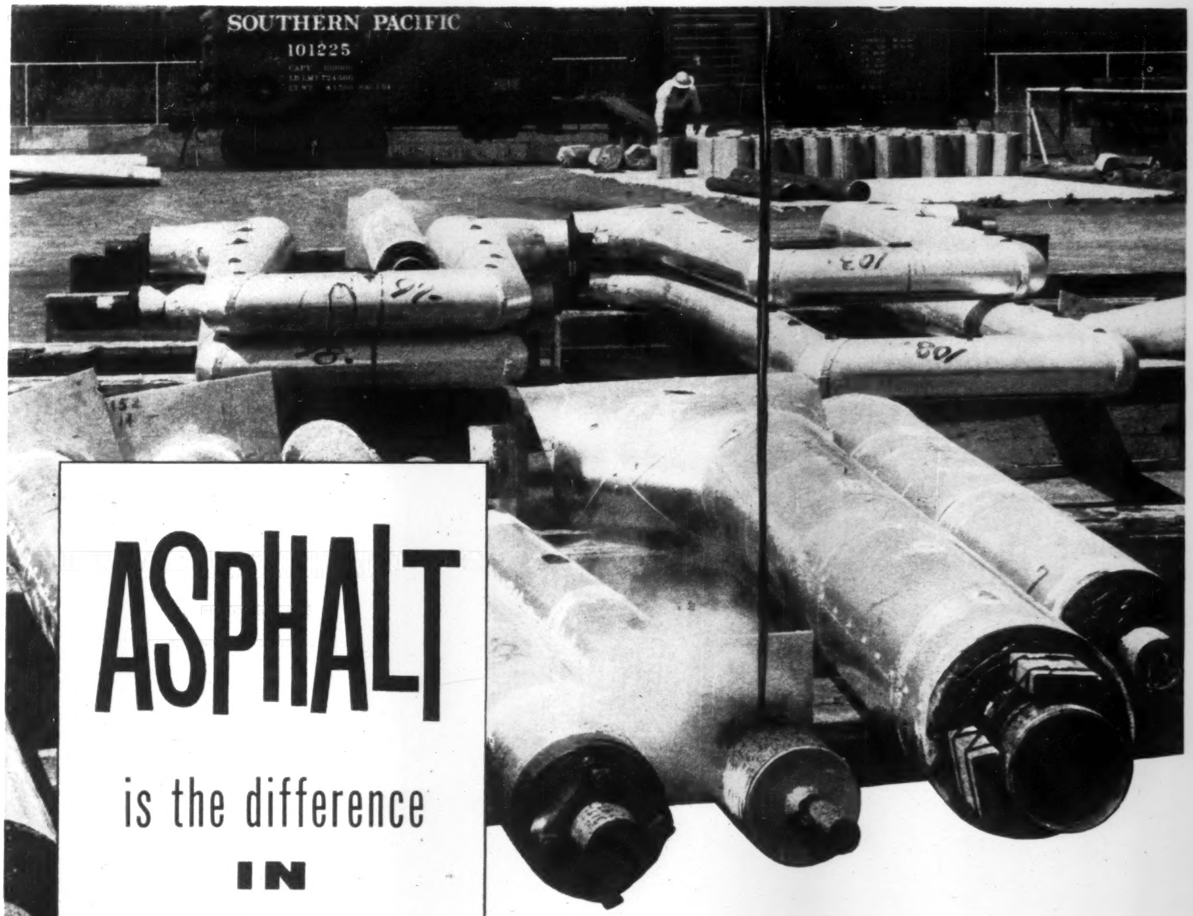
Solenoid Valve . . .

. . . for cooling applications using liquid CO_2—*Automatic Switch Co., Dept. HPAC, 391 Lakeside Ave., Orange, N.J.*

Recommended by company for low temperature, tumbling barrels and environmental test chambers where constant temperature control is essential. In direct injection, remote injection types. For pressures to 1000 psi.

Ammonia Unit . . .

. . . with hot gas defrost pan—*Refrigeration Engineering, Inc., Dept. HPAC, 7250 E. Slauson Ave., Los Angeles 22.*



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INSULATED PIPE

When D.I.P. goes underground, its integral layer of asphalt becomes the guardian of your installation.

Among all pre-sealed insulated conduit, only D.I.P. with asphalt has complete and permanent waterproofing . . . only D.I.P. with asphalt has total defense to corrosion. This exclusive safeguard is the reason why D.I.P. pipe and insulation retain their original efficiency after years underground, even after decades!

This tough, non-porous, high-melting-point barrier is the important difference in insulated underground piping. *It is your guarantee that you will have less maintenance cost tomorrow, if you specify D.I.P. today.*

Original cost is low, too! D.I.P. is shipped in standard pre-fabricated increments . . . ready for simple position-welding and rapid field-jointing.

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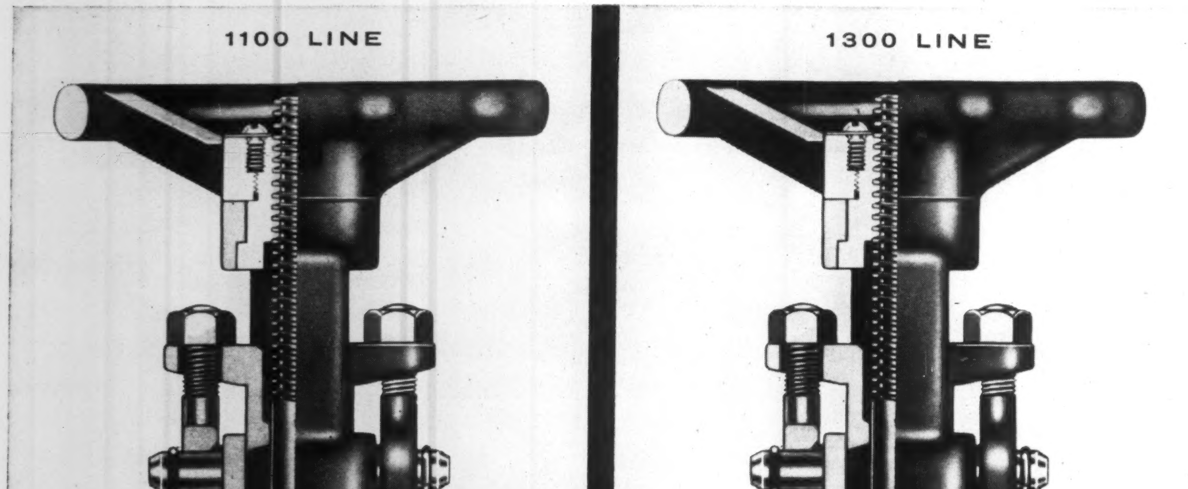
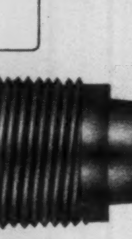
STAFF ENGINEERS AND REPRESENTATIVES IN PRINCIPAL CITIES AND IN CANADA ARE AT YOUR SERVICE.


1100 LINE

1300 LINE

New, OIC bolted bonnet, 600 lb. forged steel gate valve lines, ½" to 2" with HCH, all purpose trim.

2 new rugged OIC forged steel lines



Both feature the modern and rugged bolted bonnet joint, which simplifies and lowers the cost of maintenance.

Both feature a soft iron gasket securely retained in the bolted male and female body-bonnet connection to assure enduring tightness.

Both feature 13% chrome stainless steel trim with 1000 Brinell, duracased wedges.

Both feature plenty of gripping area for pipe wrenches on pipe ends; there's no interference with body-bonnet flanges. Simplifies joint make-up!

The 1300 line includes a *high flow* port area, offering full-flow characteristics.

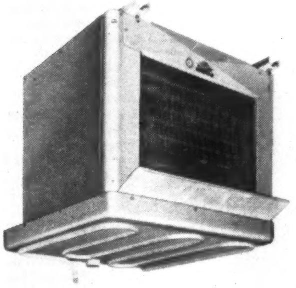
The 1100 line, with standard flow ports, is compact, economical, and includes the same high quality, rugged features and trim as the 1300 line.

Most valve users have applications suited to both of these new OIC valve lines. Write for Bulletin *#195-R* illustrating features and specifications that fit these newest forged steel valves to your services.

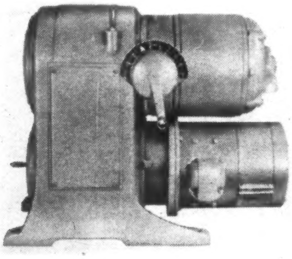
OIC

THE OHIO INJECTOR COMPANY • WADSWORTH, OHIO

VALVES | **FORGED & CAST STEEL, LUBRICATED PLUG, BRONZE & IRON VALVES**



With defrost coil on pan, low temperature ammonia unit available for either flooded or direct expansion operation. Pan, defrost coil, cooling coil of steel fins and steel tubes are all hot dipped galvanized after fabrication.



Power Unit . . .

. . . with more compact design for multiple drive system—*U.S. Electrical Motors, Inc., Dept. HPAC, Box 2058, Terminal Annex, Los Angeles 54.*

"Varidyne" unit redesigned with drive motor and alternator on same side—important where space is factor, says company. Power unit engineered to provide variable frequency power to motors in system, thus electrically linking them together. Alternator, driven at variable speeds, generates frequency proportionate to its speed, transmits this variable frequency to each of motors in system.

Air Conditioner . . .

. . . with "Trimline" design—*Gibson Refrigerator Co., Div. of Hupp Corp., Dept. HPAC, Greenville, Mich.*

In 3/4, 1 hp models, measures 17½ in. front to back. 1 hp unit operates on 115 volts; 3/4 hp unit is low-amp

For dependable water level control use
MAID-O'-MIST
FLOAT CONTROL VALVES

Thrifty answer to limited space in
HUMIDIFIERS
PAN FILLERS
AIR CONDITIONERS
AIR WASHERS

Nº 51

FAMOUS No. 50 SERIES

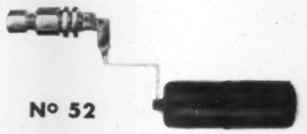
Compact, precision-designed, you can count on MAID-O'-MIST float control valves to effectively meet your water-level control requirements. An acknowledged leader in its advanced engineering, they give faithful performance.

No. 51 FLOAT CONTROL VALVE

Only 5¾" long overall, including copper float 2⅛" in diameter x 1¼" deep. Stem and body made of brass . . . . valve seat of hard nylon, protected with fine metal screen. Can be fitted in 9/16" hole or screwed directly into tapped opening. Up to 85 lbs. pressure; ½ gal. per minute at 50 lb. pressure.

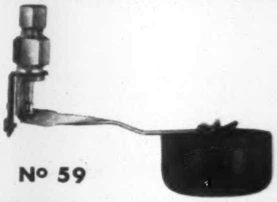
No. 52

Similar to No. 51, but designed for 1 gal. per minute capacity at 50 lbs. pressure, with pressures to 125 lbs. Overall length. 8", with 1½" x 4⅛" long float.


Nº 52

No. 59

Valve is vertically mounted with special bracket to mount on reservoir or pan well above water line. Just 5" long.


Nº 59

No. 6917

Series Diaphragm Valves

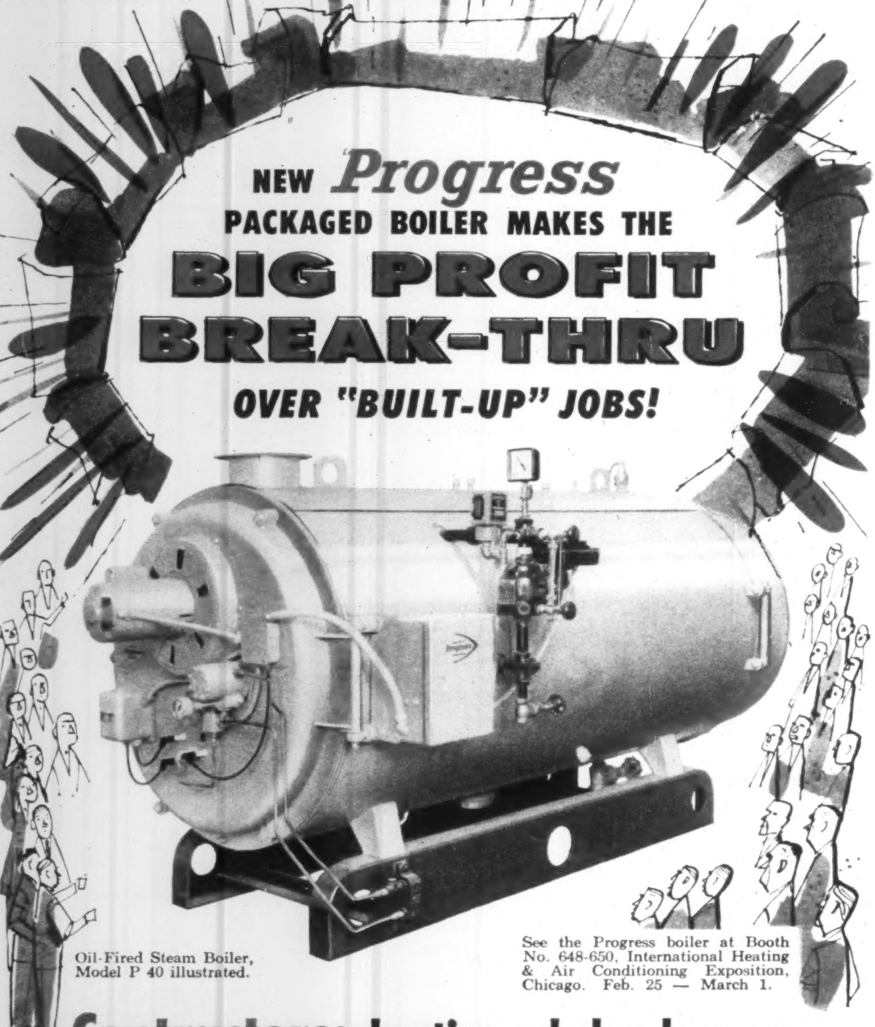
Heavy duty, large capacity water level controls, rugged and strong. Capacities 1¼ gal. to 6 gal. per minute.

Nº 6917

Get full information from your jobber or write for catalog today

MAID-O'-MIST Inc.

MAID-O'-MIST, Inc.
3217 NORTH PULASKI ROAD · CHICAGO 41, ILL.



NEW *Progress* PACKAGED BOILER MAKES THE BIG PROFIT BREAK-THRU OVER "BUILT-UP" JOBS!

Oil-Fired Steam Boiler,
Model P 40 illustrated.

See the Progress boiler at Booth No. 648-650, International Heating & Air Conditioning Exposition, Chicago. Feb. 25 — March 1.

Contractors: heating wholesalers are now delivering 5 sizes to 1,340,000 Btu

- **Complete package — undivided responsibility**
- **Full-fire, factory tested**
- **Field starting service**

The Qualified Cooperative Wholesalers listed at right are *now delivering* Progress packaged boilers — acclaimed the most sensational commercial heating advance in 25 years!

New Progress *packaged* boiler saves you up to two days installation time . . . forever ends "scatter buying" and delays of multiple purchases. One source . . . one order . . . one responsibility!

**See your nearest wholesaler NOW.
If not listed, write:**

CLEAVER-BROOKS COMPANY
Dept. A, 313 E. Keefe Ave., Milwaukee 12, Wis.

Cleaver-Brooks
Progress
Packaged Boiler

BUILT EXCLUSIVELY FOR COMMERCIAL HEATING BY CLEAVER-BROOKS — ORIGINATORS OF SELF-CONTAINED BOILERS

Sold Only Through These *Qualified Cooperative Wholesalers*

ALABAMA
Birmingham • Crane Co. • Noland Co. • Smither Plumbing Supply Corp.
Montgomery • Noland Co.
Mobile • Crane Co. • May Supply Co.

ARIZONA
Phoenix • Crane Co. • Western Supply Co.
Prescott • Trulsen Engineering and Supply Co.
Tucson • Crane Co. • Tucson Pipe & Supply Co.

ARKANSAS
Little Rock • Crane Co.

CALIFORNIA
Los Angeles • Crane Co. • Familian Pipe & Supply Co., Inc. • Keenan Pipe and Supply Co.
Sacramento • Crane Co. • Heieck & Moran
San Bernadino • Crane Co.
San Diego • Crane Co. • Industries Supply Co. of San Diego
San Francisco • Crane Co. • Dallman Co.
Santa Ana • Crane Co.

COLORADO
Denver • Crane O'Fallon Co.
Grand Junction • Crane O'Fallon Co.
Pueblo • Crane O'Fallon Co.

CONNECTICUT
Bridgeport • Park City Supply Co.
Hartford • Marsden & Wasserman, Inc.

FLORIDA
Jacksonville • Crane Co. • Horne-Wilson, Inc.
Miami • Crane Co. • The S. B. Hubbard Co.
Orlando • Crane Co. • Horne-Wilson, Inc.
Tampa • Crane Co.
West Palm Beach • Crane Co.

GEORGIA
Albany • Horne-Wilson, Inc.
Atlanta • Crane Co. • Horne-Wilson, Inc.
Augusta • Crane Co.
Macon • Crane Co.
Valdosta • Marbut Co.

ILLINOIS
Aurora • Crane Co.
Chicago • James B. Clow & Sons, Inc. • Crane Co. • Inland Supply Co.
East St. Louis • Midland Plumbing Supply Co., Inc.
Rockford • Crane Co.
Springfield • Crane Co.
Waukegan • Crane Co.

INDIANA
East Chicago • Crane Co.
Evansville • Crane Co.
Indianapolis • Crane Co.
Muncie • Crane Co.
Terra Haute • Crane Co.

IOWA
Cedar Rapids • Chandler Co.
Fort Dodge • Leighton Supply Co.
Sioux City • Wigman Co.

KANSAS
Wichita • Crane Co.

KENTUCKY
Ashland • Ben Williamson & Co.
Lexington • Brock-McVey Co., Inc.
Paducah • Henry A. Petter Supply Co.

LOUISIANA
Baton Rouge • Levingston Supply Co. Inc.
Lafayette • Coburn Supply Co. Inc.
New Orleans • Crane Co. • General Mill Supplies, Inc.
Shreveport • Crane Co.

MAINE
Portland • Crane Co.

MARYLAND
Baltimore • Crane Co.
Beltsville • Crane Co.
Cumberland • Tri State Mine & Mill Supply Co. Inc.

Sold Only Through These Qualified Cooperative Wholesalers

MASSACHUSETTS
Holyoke • Holyoke Supply Co.
Pittsfield • Robbins-Gamwell Corp.
South Boston • Crane Co.
Springfield • Crane Co.
Worcester • Central Supply Co.

MICHIGAN
Detroit • W. T. Andrew Co.
• Crane Co.
Flint • A. P. Engelhart Co.
• Edwin Sterner Co.
Escanaba • Northern Heating Supply
Gaylord • Nu-way Supply Co. Inc.
Grand Rapids • Crane Co.
Iron Mountain • Wittock Supply Co.
Kalamazoo • Bond Supply Co.
Lansing • Lansing Supply Co.
Marquette • Soo Hardware Co.
Petoskey • Dunstan Supply Co.
Port Huron • Huron Pipe and Supply Co.

MINNESOTA
Duluth • Crane Co. of Minnesota
Mankato • Crane Co. of Minnesota
Minneapolis • Central Supply Co.
• Crane Co. of Minnesota • Goodin Co.
St. Paul • Crane Co. of Minnesota

MISSISSIPPI
Gulfport • Paine Supply Co.
Jackson • Crane Co. • Noland Co.
Meridian • Southern Pipe & Supply Co.

MISSOURI
Kansas City • Crane Co.
• U.S. Supply Co.
St. Louis • Crane Co.
• Grinnell Company, Inc.
Springfield • Harry Cooper Supply Co.

MONTANA
Great Falls • Crane Co.

NEBRASKA
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Scottsbluff • Crane O'Fallon Co.

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• Manchester Supply Co.

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• Sanitary Plumbing Supply Co.
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• John M. Hartel & Company, Inc.
Morristown
• Smukler Plumbing Supply Co.
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Patterson • Kessler Supply Co.
Perth Amboy
• Central Jersey Supply Co.
Trenton • Crane Co.
Union • Crane Co.

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• Crane O'Fallon Co.
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Mt. Vernon • I. Burack, Inc.
Newburgh
• W. A. Case & Son Manufacturing Co.
New York • Davis & Warshow, Inc.
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Olean • LeValley McLoed, Inc.
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Greensboro • Crane Co.
Rocky Mount • Crane Co.

NORTH DAKOTA
Fargo • Crane Co.
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OHIO
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• Crane Co. • Mutual Manufacturing and Supply Co.
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Lima • Crane Co.
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Portsmouth • The Standard Supply Co.
Springfield • Southeastern Sales Co.
Toledo • Crane Co.
• Heating Trades Supplies, Inc.

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Ponca City • Ames Co.
Tulsa • Crane Co.

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• Appleby Bros. & Whittaker Co., Inc.
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• Lebanon Plumbing Supply Co., Inc.
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Danville
• Plumbing & Mill Supplies, Inc.
Lynchburg • Cleland Co.
Newport News • Crane Co.
Norfolk • Crane Co.
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WEST VIRGINIA
Bluefield • Bailey Lumber Co.
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WISCONSIN
Fond du Lac • Plumbers Supply Co.
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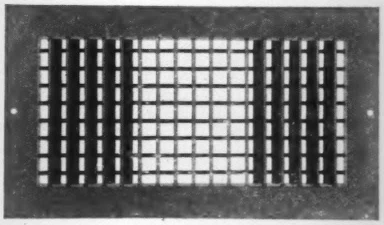
• United Plumbing & Heating Supply Co.
OSHKOSH • Crane Co.
Racine • Thomas Supply Co.
Sheboygan • J. J. Koepsell Co.
Wisconsin Rapids
• Frank Garber Co., Inc.

WYOMING
Casper • Crane Co.

Cleaver-Brooks
Progress
Packaged Boiler

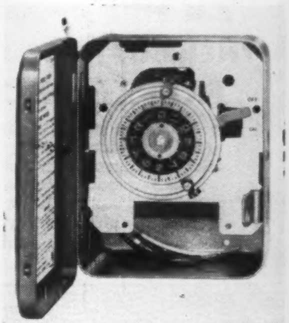
model. May be installed flush inside, all the way inside, halfway, through the wall, or against glass on casement windows.



Grille . . .

. . . with multiple deflection design—*Midco Register Corp., Dept. HPAC, 1059 Grand Ave., St. Paul.*

Vanes 11/16 in. in depth have 2/3 in. centers, are pivoted in front to give alignment at any setting, says company. Combination of front, rear vanes is said to give absolute control of directional flow, throw. In three styles: vertical front with horizontal rear vanes, horizontal front with vertical rear vanes or single front vanes, vertical or horizontal.



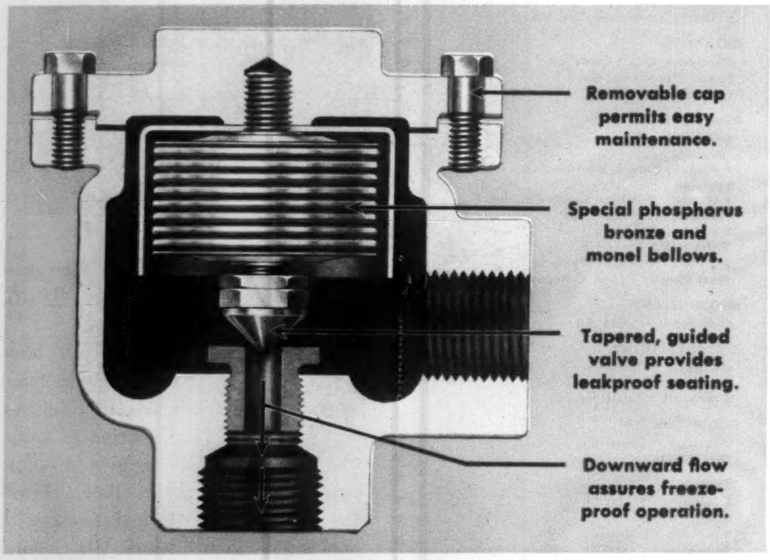
Timer . . .

. . . for controlling *on-off* cycles 10 sec to 12 min—*International Register Co., Dept. HPAC, 2620 W. Washington Blvd., Chicago 6.*

"Cycler-12" recommended by company for use on ventilating fans, pumps, process timings, other industrial uses requiring flexible cycles of operation. Will accommodate up to 12 sets of *on-off* trippers, says company. Available for 125 volt operation with 1875 watt capacity.

ANDERSON PRESENTS...

THE GREATEST ACHIEVEMENT IN INDUSTRIAL THERMOSTATIC STEAM TRAPS


Removable cap permits easy maintenance.
Special phosphorus bronze and monel bellows.
Tapered, guided valve provides leakproof seating.
Downward flow assures freeze-proof operation.

NEW QUIK-FLEX

THERMOSTATIC STEAM TRAPS WITH THE FREEZE-PROOF GUARANTEE!

● Entirely new in design and engineering, here is one of the greatest achievements of all time in industrial thermostatic traps. Anderson's trap designers have engineered a trap that can be *guaranteed freeze-proof*—used with utmost safety in any outdoor or open-sided building installation. In addition, they are made with Anderloy valve and seat designed especially to resist scoring! Specify freeze-proof Quik-Flex Thermostatic Steam Traps.

THE V. D. ANDERSON COMPANY
division of International Basic Economy Corporation • 1949 West 96th Street, Cleveland 2, Ohio

ANDERSON TRAP CO.

Please send Bulletin 257 describing your new Quik-Flex Thermostatic Steam Trap with the Freeze-Proof guarantee.

Name ____________________

Company ____________________

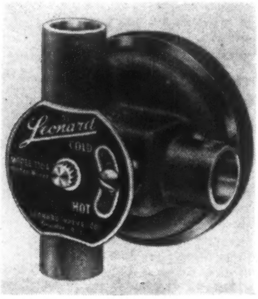
Address ____________________

City ____________ *Zone* ____ *State* ________

QUALITY STEAM TRAPS SINCE 1886

EQUIPMENT DEVELOPMENTS

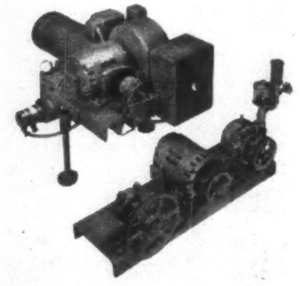
Continued



Tempering Valve . . .

. . . designed for direct copper tube installation—*Leonard Valve Co., Dept. HPAC, 1360 Elmwood Ave., Cranston 7, R.I.*

Requires no adapters, says company. May be installed without removing "Dura-Trol" thermostatic element. Unit engineered to mix cold water with high temperature hot water at heater outlet (tank or tankless); to deliver water at safe, desirable temperature (adjustable up to 180 F). Sizes available: ½ or ¾ in. for sweat connection, ½ to 2 in. standard pipe thread.

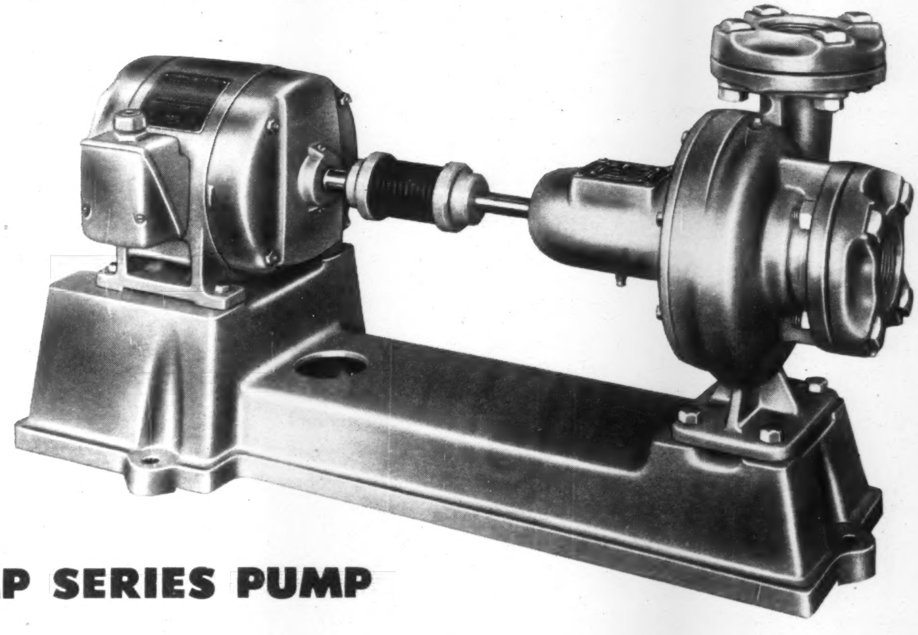


Oil Burners . . .

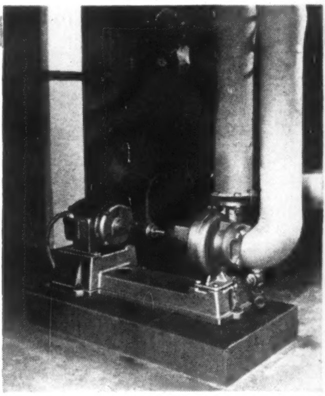
. . . engineered for high efficiency from No. 5 fuel—*York-Shipley, Inc., Industrial Div., Dept. HPAC, York, Pa.*

Preheater (2000 watt) heats oil to burning temperature. Feature is said to provide high fuel cost saving. Also burns Nos. 1, 2, 4 oils. Other features are: iris shutter to provide accurate, metered air control; built-in viscosity compensator to assure constant firing rate; improved air-oil atomizing nozzle, says company. Compressor, pump and motor are located on separate chassis, which may be in-

NEW FROM TACO



MP SERIES PUMP



For quiet, vibrationless operation and rugged dependability on large installations

Designed specifically for heating and cooling systems requiring quiet, smooth operation, the new Taco MP series pump offers a host of outstanding features:

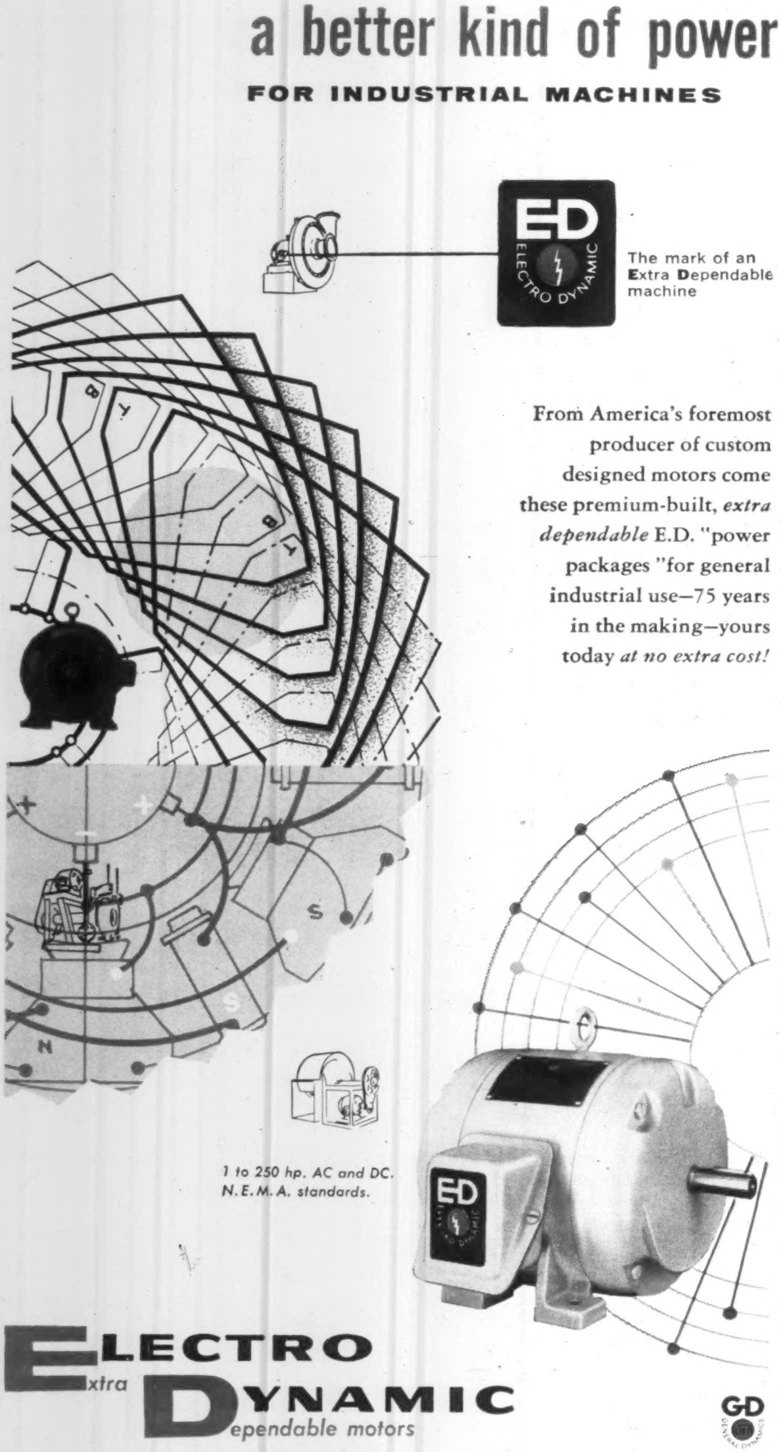
- **Water-tight, self-adjusting, self-lubricated mechanical seals.**
- **A motor selected for quiet operation, equipped with oil lubricated, bronze sleeve bearings.**
- **A spring drive coupling which easily absorbs starting torque and designed for quiet operation.**
- **A long-life impeller shaft of stainless steel, hardened and ground to a mirror finish.**
- **Bronze bearings in bracket, separated by a thrust collar attached to the shaft, absorb all end thrust.**
- **An oil bath circulating system with modern slinger rings, lifts oil to both bronze bearings.**
- **Bearing bracket, impeller and shaft are completely removable without disturbing motor, volute or piping connections.**
- **A closed type impeller of bronze or cast iron, dynamically balanced for smooth noiseless operation and designed to eliminate hydraulic thrust.**
- **Volute on body legs bolted directly to the base prevent piping strains from changing pump alignment.**
- **A base of cast iron designed with a three-point floor mounting to simplify leveling. Provision is also made to fill with concrete for sound deadening.**

For the features that mean a better performance for every large hot water heating or cooling system, put the new Taco MP series pump on the job!

Better Heating
Better With TACO

TACO HEATERS, INCORPORATED
1160 Cranston Street, Cranston 9, R. I.

342 Madison Ave., N. Y. 17, N. Y.
4 Gilead Place, Toronto 2, Can.



a better kind of power

FOR INDUSTRIAL MACHINES

The mark of an **E**xtra **D**ependable machine

From America's foremost producer of custom designed motors come these premium-built, *extra dependable* E.D. "power packages "for general industrial use—75 years in the making—yours today *at no extra cost!*

1 to 250 hp. AC and DC. N.E.M.A. standards.

ELECTRO Extra DYNAMIC Dependable motors

PRODUCT OF GENERAL DYNAMICS

NEW...

Write for Brochure 100 and literature on new E.D. motors and drives.

Electro Dynamic division of General Dynamics Corporation Bayonne, New Jersey

E.D. "Selectrol" Variable Speed Drives

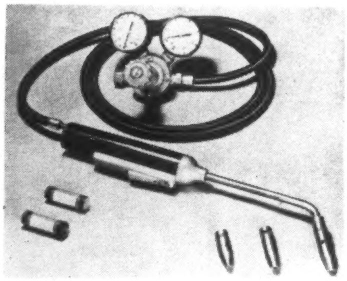
New Re-rated E.D. Motors

Gear-ED-motors

EQUIPMENT DEVELOPMENTS

Continued

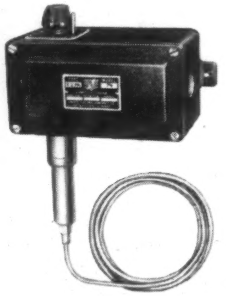
stalled on wall or suspended from ceiling. Model TH-60 burns from 5 to 20 gph of oil and has maximum boiler rating of 60 hp. Model TH-84 has oil consumption of 7 to 28 gph and maximum boiler rating of 84 hp.



Acetylene Torch . . .

. . . designed to light automatically when operator presses control lever, shut off "instantly" when not in use —*Velocity Power Tool Co., Dept. HPAC, 201 N. Braddock Ave., Pittsburgh.*

Uses battery powered ignition. No lock-on position for control lever. Feature is said to insure automatic shutoff. "Torch-O-Matic" provides flame temperature of approximately 3000 F. Nozzles interchangeable in three sizes.



Temperature Control . . .

. . . for remote bulb operation—*United Electric Controls Co., Dept. HPAC, 79 School St., Watertown 72, Mass.*

"Type E27A" contains two switches and, in many applications, may be used in place of two separate single switch controls, says company.

why engineers go for Gun-Pakt Expansion Joints

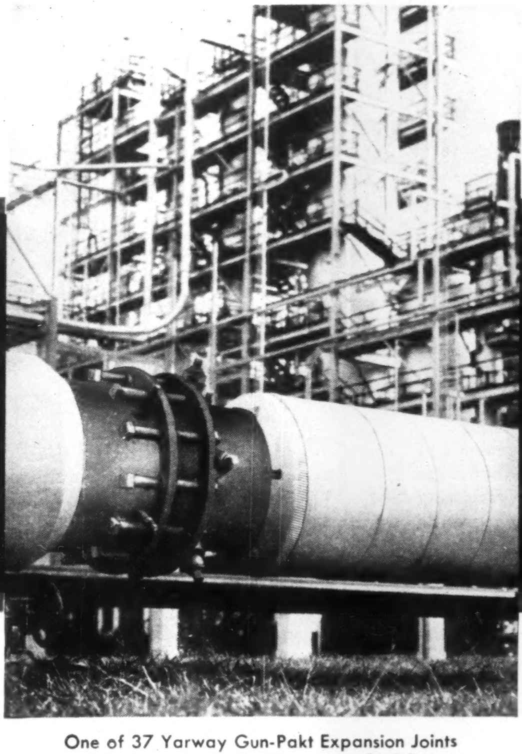
Engineers go for Yarway Gun-Pakt Expansion Joints because:

NO SHUTDOWNS. With Gun-Pakt Joints when new packing is needed, it is added under full steam pressure, right on the job—no unpacking, no shutdowns, no service interruptions.

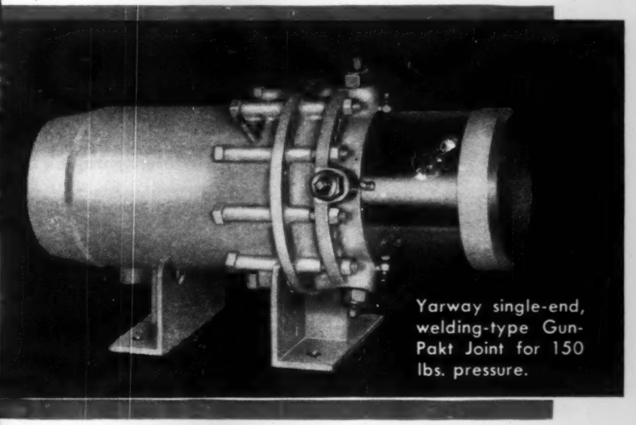
FEWER JOINTS NEEDED. With Gun-Pakt Joints you need fewer joints per length of pipe line, with traverses up to 12″ single and 24″ double.

LONG SERVICE—NO METAL FATIGUE. Gun-Pakt Joints give long, trouble-free service life—no fatigue failures.

LOW MAINTENANCE. Maintenance records show the costs for servicing Gun-Pakt Joints are very low. One utility reports only 65 cents per year per joint—another reports less than half that.



One of 37 Yarway Gun-Pakt Expansion Joints installed at giant oil refinery on Gulf Coast. Gun-Pakt Joints at this refinery range in size from 1½″ to 14″.



Yarway single-end, welding-type Gun-Pakt Joint for 150 lbs. pressure.

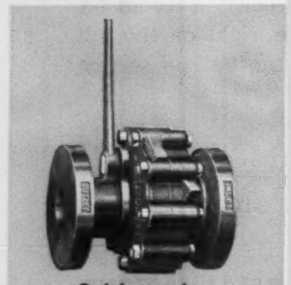
Leading institutions, central heating stations and industrial plants "go for Gun-Pakt" again and again. Write now for latest bulletin EJ-1914.

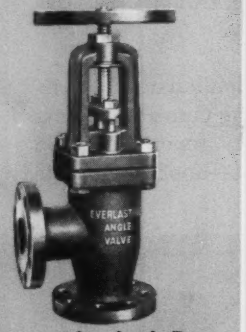
YARNALL-WARING COMPANY
107 Mermaid Avenue, Philadelphia 18, Penna.
BRANCH OFFICES IN PRINCIPAL CITIES

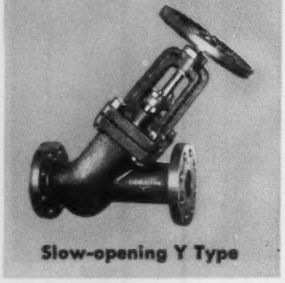
YARWAY **GUN-PAKT EXPANSION JOINTS**

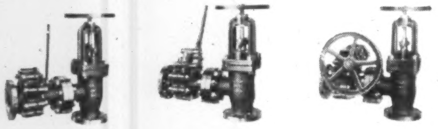
Combine them

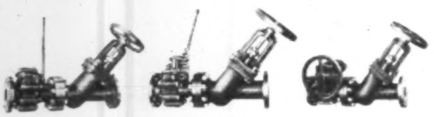
any way you choose
for your boiler blow-off

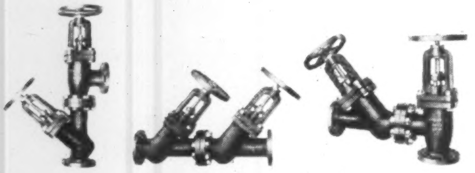

Quick-opening

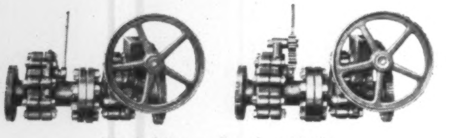

Slow-opening Angle Type


Slow-opening Y Type


Straightway and Angle Duplex Units


Straightway and Y Duplex Units


Angle and Y Duplex Units


Straightway Duplex Units

More than a dozen different arrangements of valve designs and operating methods are available to you in the complete Everlasting line of boiler blow-off valves for operating pressures up to 600 psi. Here is a range of selection from which you can get exactly the combination you wish.

For half a century, Everlasting Valve designs have been proving their effectiveness, reliability and durability—the kind of service you need for boiler blow-off. Each design fully meets ASME Code requirements. **WRITE FOR BULLETIN**

Everlasting
VALVES
FOR BOILER BLOW-OFF

For "everlasting" service, use

EVERLASTING *Valves*

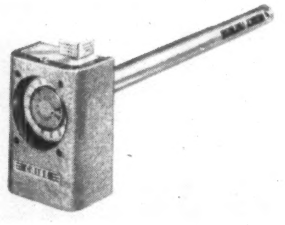
EVERLASTING VALVE CO.
61 FISK STREET, JERSEY CITY 5, N. J.

EV384

EQUIPMENT DEVELOPMENTS

Continued

Complete unit consists of bulb, capillary tube, bellows, control head. Models available with range spans 100 or 200 F between limits of −150 and 650 F, and with *on-off* differentials of about 1 and 2 F deg.



Fan, Limit Control . . .

. . . combination added to company's line—*Crise Controls Div., Acro Mfg. Co., Dept. HPAC, 2040 E. Main St., Columbus, Ohio.*

Design offers separate fan and limit circuits, ¾ hp fan switch rating, gold plated contacts for limit circuit, switches. Cited feature is arrangement of terminals to provide extra space for faster, easier wiring. Limit side may be used for line, low voltage or millivolt circuits.

Air Conditioners . . .

. . . in company's 1957 line—*Fedders-Quigan Corp., Dept. HPAC, 58-01 Grand Ave., Maspeth, N.Y.*

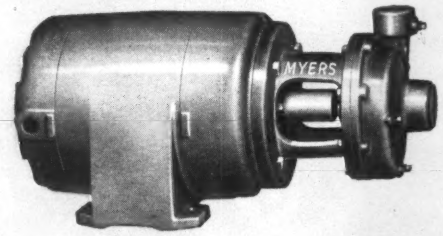
Line includes: "Thin-Lo" units, in ¾, 1 hp models (featuring 7½ ampere, ¾ hp unit); "multi-room" 115 volt, 1 hp model, designed to accomplish 1 hp cooling without requiring bringing in of 208-230 volt service; "Adaptomatic" unit available in 2 hp size with 1200 sq ft cooling capacity; "Customatic" and "Supreme Customatic" 1 hp reverse cycle units.

Portable Drafting Unit . . .

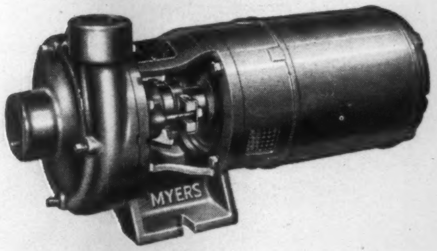
. . . designed to aid in making accurate scale drawings "in the field" —*Lloyd Tool Corp., Dept. HPAC, 1620 N. Broadway, Burbank, Calif.*

Measures 11 in. high, 13 in. wide. Complete with carrying case for triangles, accessories.

Model 150 M Model 200 M
Shown with stuffing box
(available with rotary seal)

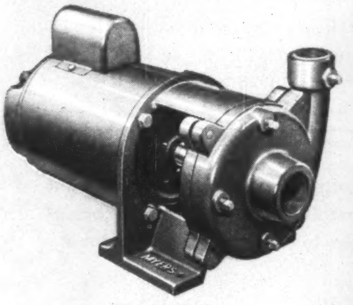


Model 125 M Model 150 M
Shown with stuffing box
(available with rotary seal)

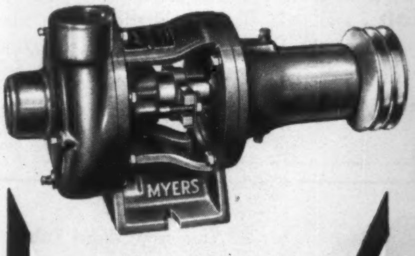


98 MODELS

of Myers Centri-Thrift Pumps for cooling-tower application



Model 100 M
Rotary seal only



Model 125 B
Model 150 B
Model 200 B
Shown with stuffing box
(available with rotary seal)

Model 100 B
Rotary seal only

CHOICE OF MOTORS—Single or three phase, single or dual voltage, open or enclosed.

WIDE SELECTION OF SIZES—1" x 1¼", 1¼" x 1½", 1½" x 2", 2" x 2½", threaded discharge and suction. ⅓, ½, ¾, 1, 2, 3, 5 and 7½ horsepower, motor-mounted or belt-driven.

CHOICE OF SHAFT SEALING—Regularly fitted with rotary seal. Stuffing box may be specified on "125", "150" and "200" models.

WIDE RANGE OF CAPACITIES AND HEADS—Capacities to 240 GPM. Heads up to 140 feet.

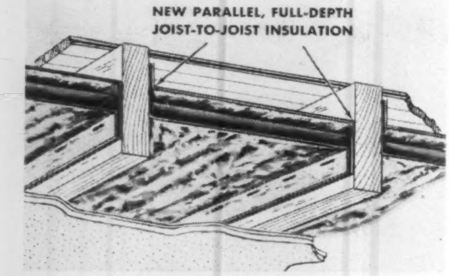
OUTSTANDING QUALITY FEATURES

- All-bronze impeller, accurately balanced for smooth operation.
- Removable bronze wearing rings, easily replaced for longer pump life.
- Corrosion resistant, stainless steel shaft for trouble-free service.

Write today for Bulletin 210 on Myers Centri-Thrift Pumps

Myers® **PUMPS** **WATER SYSTEMS AND WATER CONDITIONERS**

The F. E. Myers & Bro. Co., Ashland, Ohio • Kitchener, Ont. **Myers®**



Thermal Insulation . . .

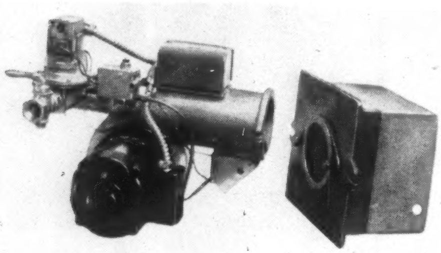
. . .with multiple layers of reflective air spaces which are parallel and rectangular—*Infra Insulation, Inc., Dept. HPAC,* 525 *Broadway, New York* 12.

Design provides side supports which stretch, keep open permanently and parallel its layers of aluminum and air spaces, says company. Successive insulating layers are said to give protection with full uniform depth over entire area from joist to joist.

Underground Pipe Protection . . .

. . .for piping systems for utilities, industrial plants, institutions, other multiple building projects with centralized heating plants—*C. S. Ziegler & Co., Dept. HPAC, Great Neck, N.Y.*

Of natural mineral gilsonite, "Tri-sul-ite" is new name for product formerly called "Insul-ite." Is said to provide three zones of corrosion protection, water impermeability, insulation. When poured around piping in ditch, is cured by temperature through piping. In three types depending upon temperature of pipes to be protected.



Incinerator Burner . . .

. . .available in seven arrangements—*Eclipse Fuel Engineering Co., Dept. HPAC, Rockford, Ill.*

Packaged "Series No. 600 SIB" units designed particularly for commercial, industrial incineration applications. Six sizes have rated capacities adjustable 100,000 to 500,000 Btu per hr with seventh size (636 SIB) with 900,000 Btu per hr capacity. To put into operation requires only hooking up of gas, electricity, says company. Integral fan supplies combustion air.

REED

● This new Reed Tube Cutter—a faster, lighter-weight roller cutter—is the first cutter for 1" to 3" copper tubing; equally ideal for brass and aluminum tubing from 1" to 3".

New TC3 TUBE CUTTER!

CUTS 1"-3" TUBE No TC3
APPROX. 2/3 ACTUAL SIZE
PATENT PENDING

SO light that it weighs just a fraction as much as conventional pipe cutters in the same size range, this new Reed TC3 Tube Cutter does a faster, more convenient cutting job on 1" to 3" tube of copper, brass or aluminum.

THE new Reed TC3, with its single cutting wheel in the movable arm, is far quicker and easier than a hacksaw; the ultra-thin alloy cutting wheel leaves almost no burr; and TC3's lighter pressure avoids distortion of tubing, thereby safeguarding tightness of solder or slip joints. With the single wheel in plain view for lining up with the cut-off mark, the cutter hooks quickly and easily on to tube for a right angle cut.

FRAME of this new Reed TC3 is as light as it is strong and durable because it has been specially-designed of high-grade ductile iron

REED

REED MANUFACTURING COMPANY ERIE, PA., U.S.A.

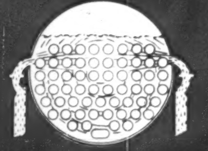
AMONG MEN WHO KNOW HEATING BEST!

First Choice

IN COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL HEATING BOILERS

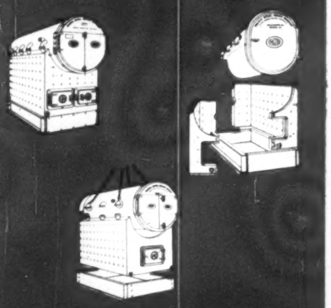
PACIFIC BOILERS

ONLY PACIFIC BOILERS GIVE YOU



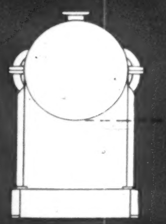
JET-ACTION CIRCULATION

Exclusive Jet-Action, which sweeps hot water and steam across heating tubes, provides maximum heat transfer.



1, 2 or 3 PIECE CONSTRUCTION

Component parts of split fire-box boilers pass through windows, doorways, skylights!



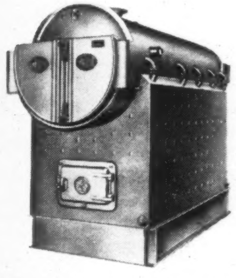
MORE COMBUSTION VOLUME

Cubic foot combustion volume of Pacific Boiler is greater than any other comparable boiler of equal capacity!

PLUS

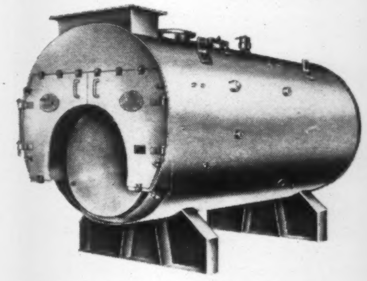
- INDUCED DRAFT FANS
- BUILT-IN WATER HEATERS
- OIL, GAS, COAL FIRED

Pacific Steel Boilers, in types and ratings for all size buildings, are designed for quick and easy installation on the job site. Once installed, they give your customers all the benefits of high efficiency, long life and low maintenance cost. If you are now estimating any heating installations, or need special engineering help, look *first* to Pacific Steel Boilers. The Pacific representative near you will work with you.



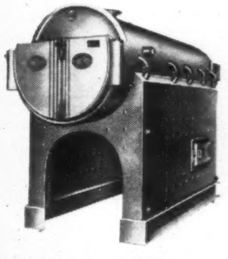
PACIFIC LOW WATERLINE BOILER

- High Efficiency with Minimum Headroom
- Faster Steaming with Less Fuel Consumption
- Self-Cleaning Design for Less Maintenance



PACIFIC "SCOTCH TYPE" BOILER

- "Wetback" Construction Eliminates Repair or Replacement of Costly Refractories
- Proper Design Promotes Rapid Circulation
- More Prime Surfaces for Better Heat Absorption



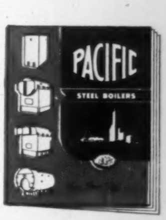
PACIFIC LO-SET BOILER

- Extra Low Waterline, Extra Low Setting
- Less Floor Space and Headroom Needed
- Grade Level Engineering and Installation

WHATEVER YOUR INSTALLATION—

SEND FOR COMPLETE DATA ON ALL

PACIFIC STEEL BOILERS



This 42-page Bulletin (Form AP 237-G) gives you all the engineering and application facts you'll need for any type of installation, large or small. Write for your copy.

ASME
CODE STAMP

MEMBER
SBI
REG. U.S. PAT. OFF.

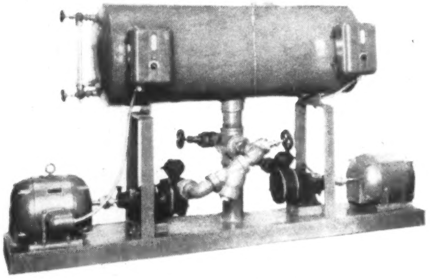
Pacific Steel Boiler DIVISION

General Offices
National-U S Radiator Corporation
Johnstown, Pennsylvania

got a liquid transfer problem?

use EAGAN PUMPS

Eagan pumps are a big bargain from a performance, construction and price standpoint. They're designed to meet and exceed your liquid transfer requirements as they do for users throughout many different industries.

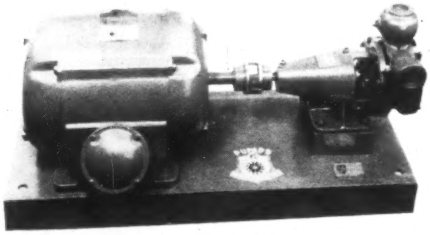


CONDENSATE PUMPS

Capacities up to 100,000 sq. ft. EDR at 200 psi. Five types of units to meet all operational requirements and specifications. They include units with overhead receivers for high temperatures as well as underground receivers for buried returns, steel, cast iron and lined receivers.

BOILER FEED PUMPS

Packaged units designed to combine the function of boiler feeding and fresh water make-up. High receiver prevents flashing when traps begin to leak. Made in a single and duplex construction for capacities to 100,000 sq. ft. at 200 psi.

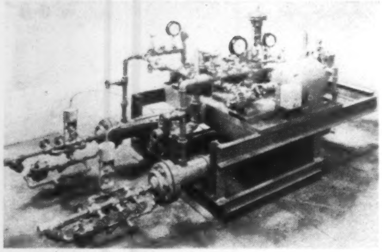


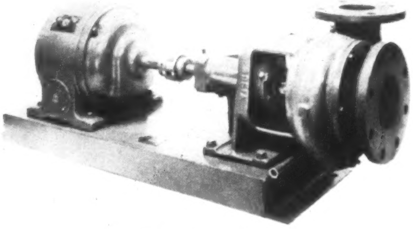
TURBINE PUMP

Made for capacities to 200 gpm. at pressures to 200 psi. in many metals for corrosive chemicals as well as water. Incorporates preloaded bearings to permit positive centering of impeller without lateral bearing play. This permits high speeds without excessive wear.

FUEL OIL PUMP AND HEATER SETS

For combustion preparation of heavy industrial fuel oil. Packaged units, delivered ready to operate including integral temperature and pressure controls. They heat to 300° F., pump up to 400 psi., have capacities to 3000 gph., are easily installed, serviced.



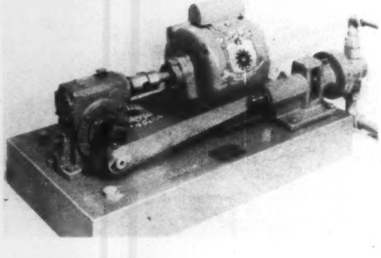


CENTRIFUGAL PUMPS

Heavy duty, two ball bearing construction. Includes valuable service features of renewable shaft sleeve and casing wearing ring. This centrifugal line will handle up to 1100 gpm. and discharge at pressures to 200 ft.

PROPORTIONING PUMPS

Controlled or metered flow for chemical feed, for processes, boiler and municipal water treatment. Capacities may be varied automatically and manually in standard capacities from 0 to 3000 gph. and pressures to 5000 psi. Packaged chemical feed units available as complete control systems.



Walter H. Eagan Co., Inc.

2336 FAIRMOUNT AVENUE
PHILADELPHIA 30, PA.

Pump Specialists Since 1920

THESE REPRESENTATIVES
CAN GIVE YOU DETAILS
ON EAGAN PUMPS

Contact the one
nearest you . . .

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See Lousiana
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1826 W. 213th St.
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NEW YORK
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SOUTH CAROLINA
See Stack — N. C.
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Cleveland 15, Ohio
(Central)
Ralph Holterhoff
P. O. Box 5774
Columbus, Ohio
OHIO (E)
William W. Evans
P. O. Box 5153, Fairlawn Station
Akron 13, Ohio
Alvin R. Close
P. O. Box 192
Toledo 12, Ohio
(S.W.)
Gary G. Schultz — see Iowa
PENNSYLVANIA (N.W.)
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Pittsburgh 27, Pa.
(C)
Bryant Rigby Co.
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Johnstown, Pa.
RHODE ISLAND
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TENNESSEE (E)
Alan G. Brown
871 McCallie Ave.
Chattanooga, Tenn.
(W)
Middle States Assoc.
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16½ N. 9th St.
Richmond, Va.
WASHINGTON (N)
E. H. Langdon Co.
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Seattle 1, Wash
WASHINGTON, D. C.
H. A. Dodge Assoc. — Government
1414 G St., N. W.
Washington, D.C.
Glegge Thomas — Commercial
723 Albee Bldg.
Washington 5, D.C.
EXPORT
Mercator Corp.
438 Walnut St.
Reading, Pa.

REPRESENTATIVES WANTED TO SELL THE FAST MOVING EAGAN LINE IN EXCLUSIVE AREAS STILL OPEN

WALTER H. EAGAN CO. INC.
2336 Fairmount Avenue
Philadelphia 30, Pennsylvania

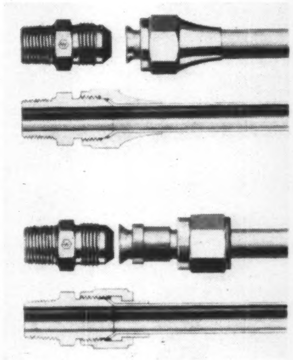
EQUIPMENT DEVELOPMENTS

Continued

Air Conditioners . . .

. . . in seven "series" containing 31 separate models—*Mitchell Mfg. Co., Div. of Cory Corp., Dept. HPAC, 3200 W. Peterson Ave., Chicago.*

1957 line includes models designed to operate on 115 volts, "space saver" units for installation in narrow windows, "Roto Cone" conditioners engineered to cool faster. Capacities range ¾ to 2 hp.



Steel Tube Fittings . . .

. . . in three-piece, two-piece types—*Weatherhead Co., Ft. Wayne Div., Dept. HPAC, 128 W. Washington Blvd., Ft. Wayne, Ind.*

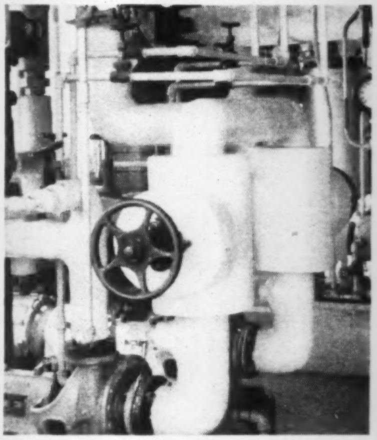
"Flare-Twin" SAE 37 deg JIC line expanded to include straight thread type fittings in styles, sizes for use with new SAE approved o-ring boss design. Such connection withstands higher operating pressures without use of backup rings, says company. Other cited features: easier assembly; minimum close coupling; less o-ring distortion; longer o-ring life; may be repeatedly disassembled, reassembled.

Electrode . . .

. . . for general purpose welding of all steels with high currents, for welding crack-sensitive steels and steels tending to produce porosity in weld metal—*Lincoln Electric Co., Dept. HPAC, 22801 St. Clair Ave., Cleveland 17.*

"Jetweld LH-70" is low hydrogen, iron powder type. Is said to have high deposition rate, easy slag re-

Swift's
LAGGING
ADHESIVES



the *Improved*
Way to Adhere
Insulation
to Piping

For bonding insulation to piping or adhering lagging cloth to insulation, Swift's Improved Lagging Adhesives give you twelve important advantages—

1. EASY TO USE
2. FAST SETTING
3. NON-HAZARDOUS
4. FLAME-RESISTANT FILM
5. MOISTURE RESISTANT
6. MOLD RESISTANT
7. GOOD UNDERCOATING FOR PAINT
8. ADHESIVE PROPERTIES
9. FLEXIBILITY
10. SAVES PAINT
11. UNIFORM
12. MEETS ACCEPTED SPECIFICATIONS

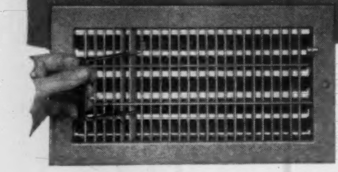
The only sure way to find out what these advantages can mean to you is by a trial order. You can get a trial size supply at the quantity price. Write for details. SWIFT & COMPANY, Adhesive Products Department, 4115 Packers Ave., Chicago 9, Ill.

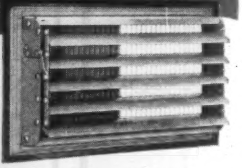
Swift
102ND YEAR

To Serve Your Industry Better

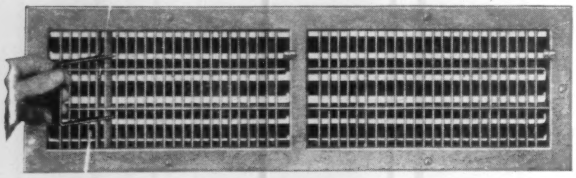
You can get
DIRECTED AIR FLOW
at any angle with

INDEPENDENT
"Fabrikated"
REG. U. S. PAT. OFFICE
AIR CONDITIONING
REGISTERS


321-A HMV


Rear View Showing "HMV" Valves

Every grille bar adjustable individually—before or after installation


321-A HMV Tandem

Any direction of air flow—right, left, up, down and any combination—is easily obtained with "Fabrikated" Style No. 321-A HMV air conditioning registers, for residence or commercial installations, on sidewalls or ceiling. The face bars are adjustable to right or left; valves on the back are adjustable to direct the air flow up or down; valves may also be fully closed, and are connected to open or close in unison.

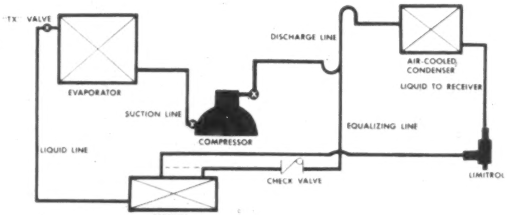
The angles of deflection and the combinations to be had are practically unlimited. Adjustments for directed air flow may be made before or after installation. Grille bars are held firmly in place and will not vibrate or rattle. "Fabrikated" registers are available in sizes from 8 x 4″ to 48 x 24″, including tandem style. Special sizes can be made without special die set-up charges.

Write for Catalog No. 56.

VISIT US AT INTERNATIONAL HEATING AND AIR CONDITIONING EXPOSITION — BOOTH NO. 437

THE INDEPENDENT
REGISTER CO.
3747 E. 93rd STREET • CLEVELAND, OHIO

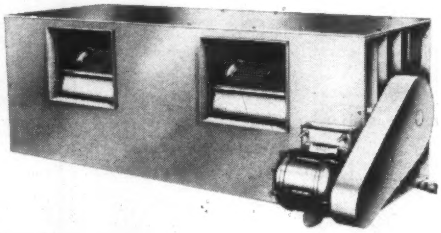
moval, good operating characteristics. Available in 1/8, 5/32, 3/16, 7/32, 1/4 in. sizes.



Condenser Control System . . .

. . .for winter operation of remote air cooled condensers—*Halstead & Mitchell, Dept. HPAC, Bessemer Bldg., Pittsburgh.*

"Limitrol" designed for maintaining proper head pressures in cold weather. Cited features: changeover from summer to winter, winter to summer operation without use of hand valves; simpler piping because bypass and all valve piping are done at machine instead of on roof.



Cabinet Fan . . .

. . .engineered for application versatility, space saving installation—*Trane Co., Dept. HPAC, La Crosse, Wis.*

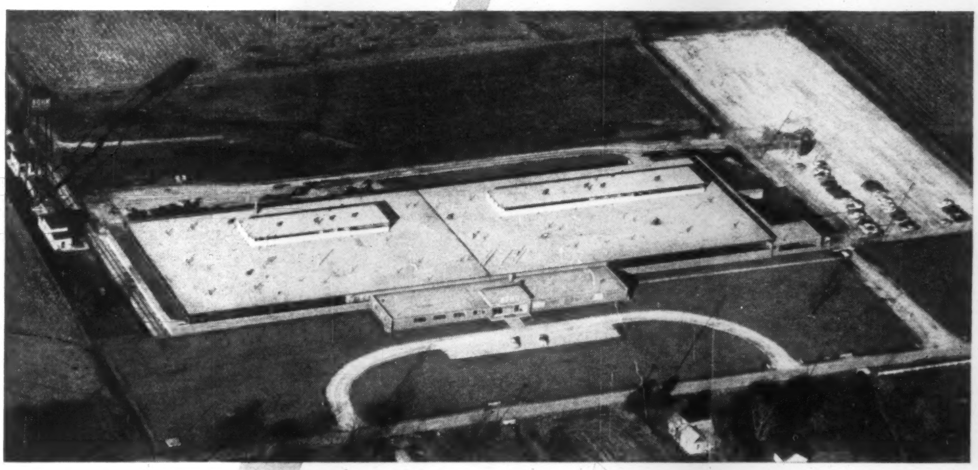
Recommended by company for operation at low noise level in buildings with low ceilings. For use in air moving systems for supply, exhaust, or recirculation of air. In 12 sizes ranging 600 to 34,500 cfm, with outlet velocities 1000 to 2600 fpm.

Leak Detector . . .

. . .with fixed head for attachment to conveyor belts of mass-produced products—*General Electric Co., Dept. HPAC, Schenectady 5, N. Y.*

Minute leaks in products can now be caught on assembly line, says company. Any container which can hold small quantity of halogen under pressure is suitable application. Small fixed head houses sensitive element. Aspirator pump mounted near head provides air sample flow through element. Leak defects indicated visually and/or audibly.

BOHN *Presents the* NEW ANGLE



...daring plans...product diversity...fresh policy

New management . . . creative engineering . . . expanded laboratory, increased production facilities, and additional sales personnel are implementing unique new policies and a dynamic sales program for you. *That's the NEW ANGLE!*

Betz Division engineers have designed and tested a complete new line of self-contained air conditioning units, remote air handling equipment, air-cooled condensers, low temperature automatic defrost units, cooling towers and evaporative condensers for refrigeration and industrial air conditioning applications.

The new plant encloses 160,000 sq. ft. of floor space. Its central location provides excellent rail, truck and air service. BOHN warehouses are also strategically located in New York, Texas and California.

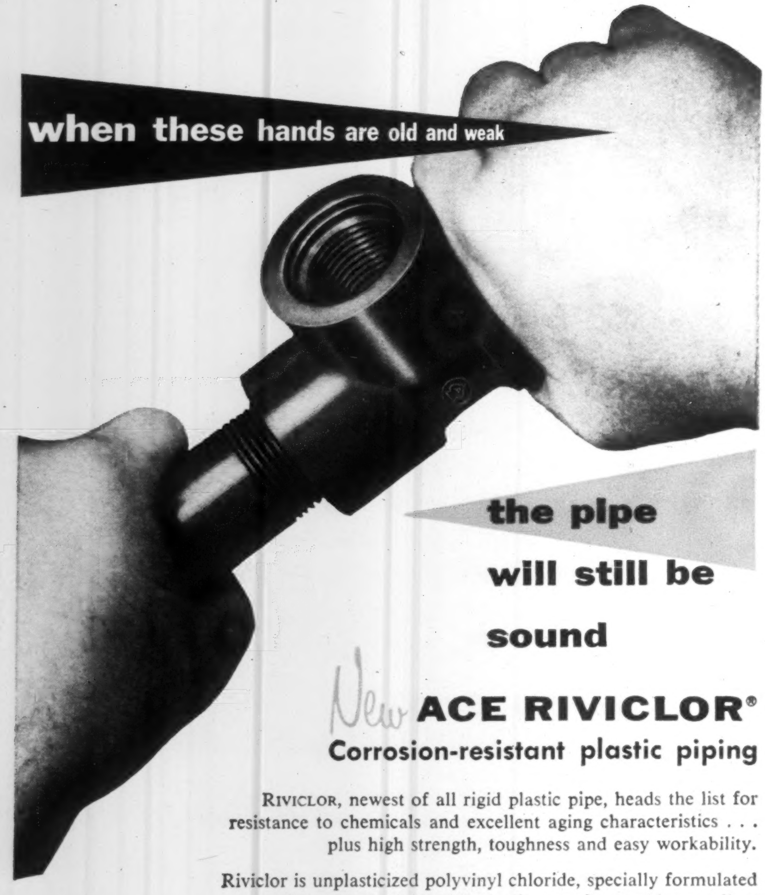
New catalogs describe the BOHN line. Write for your free copies or other pertinent information on *the NEW ANGLE.*

BETZ DIVISION
BOHN
DANVILLE, ILLINOIS

Manufacturers of Commercial
Refrigeration, Industrial
Air Conditioning and
Special Heat Transfer Surface

BOHN ALUMINUM & BRASS CORPORATION · BETZ DIVISION · DANVILLE, ILLINOIS

See Our Exhibit in Chicago at this year's International Heating & Air Conditioning Exposition, Feb. 25 - March 1.



New **ACE RIVICLOR®**

Corrosion-resistant plastic piping

RIVICLOR, newest of all rigid plastic pipe, heads the list for resistance to chemicals and excellent aging characteristics . . . plus high strength, toughness and easy workability.

Riviclor is unplasticized polyvinyl chloride, specially formulated for process piping. Non-toxic, non-flammable, excellent insulating properties. Only half weight of aluminum. Never needs painting. Smooth inner surfaces give you high flow rates with low loss of head.

Use Riviclor for all in-plant piping of mild or strong corrosives at normal temperatures . . . for liquid lines where "sweating" or corrosive vapors are problems . . . for underground piping. Pipe, fittings, diaphragm valves from ½" to 2".

Ask for Technical Bulletin CE-56.

Approved For Use With Drinking Water

NSF

ABBREVIATED TABLE OF CHEMICAL RESISTANCE

ACIDS		BASES		MISCELLANEOUS			
Acetic 50%	S	Ammonium Hydroxide 28%	S	Ethyl Alcohol	S	Carbon Tetrachloride	S
Chromic 25%	S	Sodium Hydroxide 50%	S	Methyl Ethyl Ketone	U	Plating Solutions	S
Hydrochloric 38%	S	HALOGENS		Gasoline	S	Photographic Solutions	S
Hydrofluoric 50%	L	Sodium Chloride Sat.	S	Mineral Oil	S	KEY: S—Satisfactory	
Nitric 20%	S	Ferric Chloride	S	Animal Oil	S	L—Limited to certain applications	
Sulphuric 50%	S	Sodium Hypochlorite 5%	S	Vegetable Oil	S	U—Unsuitable	
Sulphuric 98%	S			Phenol 10%	S		
				Chlorine 5%	L		
				Alum	S		

ACE processing equipment of rubber and plastics

AMERICAN HARD RUBBER COMPANY
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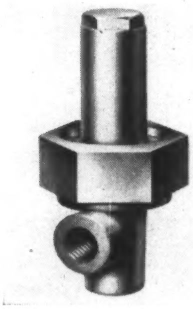

Valves . . .

. . .for relief, back pressure—*Milton Roy Co., Dept. HPAC,* 1300 *E. Mermaid Ln., Philadelphia* 18.

For use with corrosive fluids at pressures to 1500 psi, temperatures to 250 F. Topworks protected by thermoplastic diaphragms. In ¼, ½, ¾, 1 in. sizes. Units offer wide range of pressure settings which can be made with screw driver, says company.

Power Screw Driver . . .

. . .with portable, self feeding features—*Shakeproof Div., Illinois Tool Works, Dept. HPAC, St. Charles Rd., Elgin, Ill.*

"Semspak" recommended by company for mass assembly operations. Drives screws at any angle as fast as operator can pull trigger, says manufacturer. Each screw automatically fed into driving jaws. Will accommodate screws 7/17 to 1½ in. long with variety of heads.

Room Air Conditioners . . .

. . .engineered to generate negative air ions for relief of hay fever—

"WITCH"

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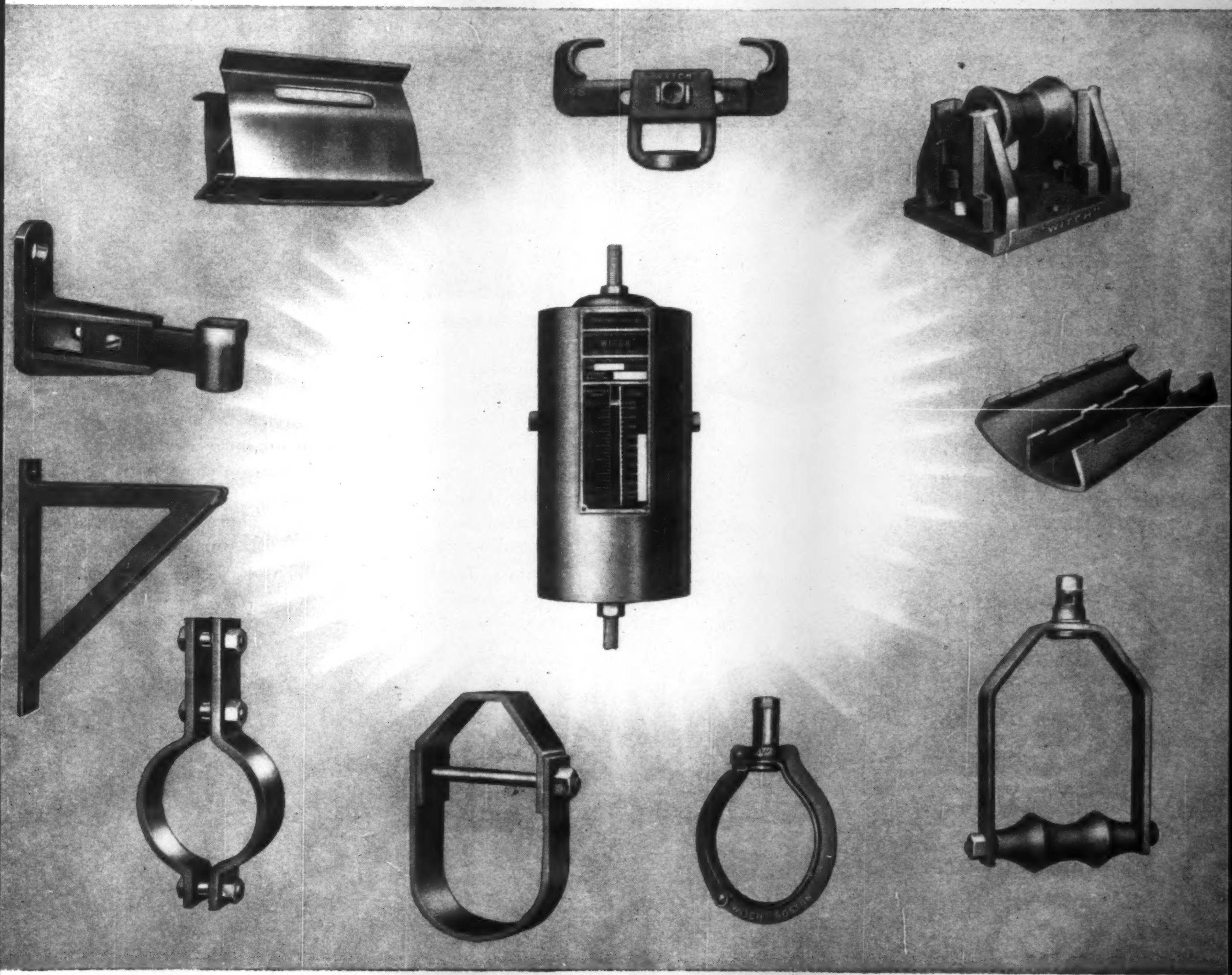
PIPE HANGERS AND SUPPORTS



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The new "I-Line" provides an attractive low contour, assuring maximum capacity or efficiency with the minimum over-all height.

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By moving a large volume of air at high velocity, this Vertical Discharge fan keeps fumes from sifting back into building.

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Three types of Allen turbines take full advantage of the economy of natural air movement.

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Remote drive Staxauster is designed to handle corrosive fumes, and/or high temperature air.

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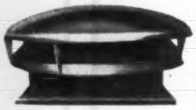
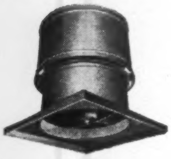
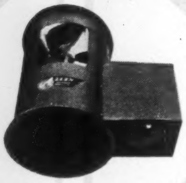
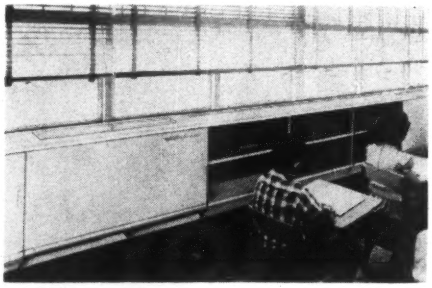






Philco Corp., Dept. HPAC, Tioga and C Sts., Philadelphia 34.

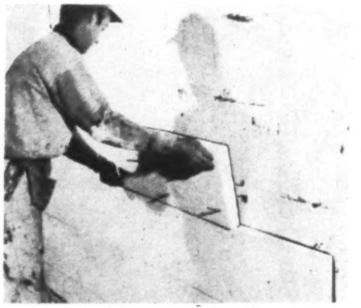
Feature of company's 1957 line, "Ionitron" unit has four part electrostatic air cleaning system which is said to trap dust, smoke, pollen, other particles.



Air Blender System . . .

. . .designed to provide heating, ventilating, ventilating-cooling for schools—*Sturtevant Div., Westinghouse Electric Corp., Dept. HPAC, Hyde Park, Mass.*

Engineered to distribute outdoor air from one central supply source to classroom under-window units. Designed primarily for installation in commercial and public buildings, is now adapted to schoolroom application, says company. Shown above is installation of custom cabinets and draft stabilizer storage cabinets. Is said to eliminate drafts from continuous type windows.



Insulation Board . . .

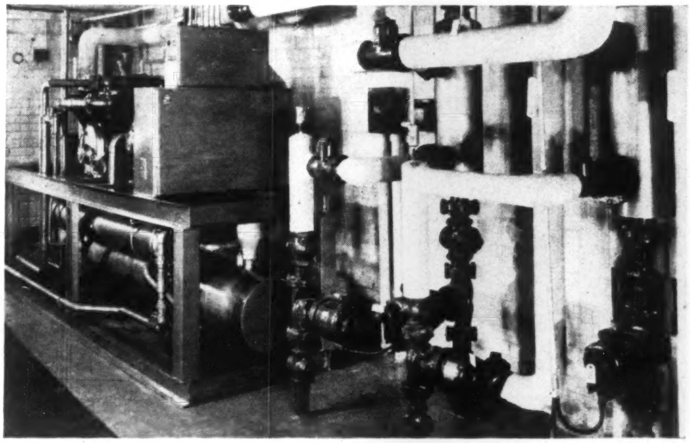
. . .formulated to combine light weight and moderate cost with high compressive strength, high efficiency—*Armstrong Cork Co., Dept. HPAC, 4400 Concord St., Lancaster, Pa.*

Of rigid, foamed plastic construction. "Armalite" recommended by company for use under concrete wearing floors, as free-standing walls in cold rooms. For temperatures −50 to −160 F. Has k factor of 0.24 at 60 F. Available in boards 2, 3, 4 in. thick in 12 × 36 in. size for cold rooms, in 36 × 36 in. size for insulating refrigerated equipment.

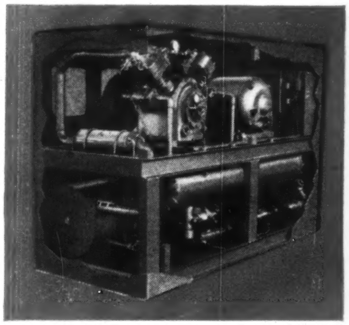
IN 1957...

get better performance...faster service with

B&G Cooling Equipment



B&G Package Liquid Cooler, Booster Pumps, Flo-Control Valves and other auxiliary equipment used in combination heating and cooling system



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A complete cooling unit for homes, apartments, commercial and industrial buildings, process work. Design highlights include low pressure drop through evaporator—non-recycling pump-down—integrated electrical control system—low center of gravity for easy installation. Completely wired, including chiller and tower pump. Send for Bulletin HB-755.

Specifying "B&G" throughout assures you of equipment known for quality—with a single manufacturer's responsibility for satisfactory operation.

B&G 1522 and 1531 Pumps, for example, have a long record for dependable, economical and *quiet* performance. Among their many features are the "Remite" leakproof mechanical Seal and vertical split case design.

B&G Evaporators, Condensers and other heat exchange equipment offer time-tested design—rugged construction—precision workmanship—all combined to provide top performance and long life. These units are built to ASME Code requirements.

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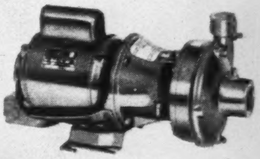
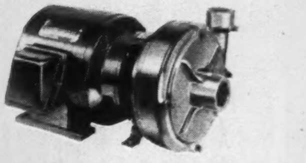
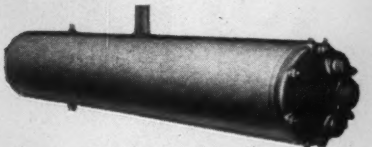
To give you fast service, most frequently used sizes of the units starred below are kept in factory stock for immediate delivery. Write for descriptive literature.



★ B&G Series 1522 Pumps

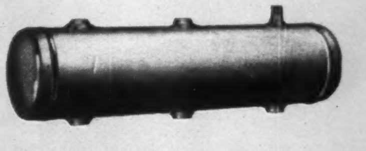


★ B&G Series 1531 Pumps



★ B&G Model CRF Straight Tube Condensers

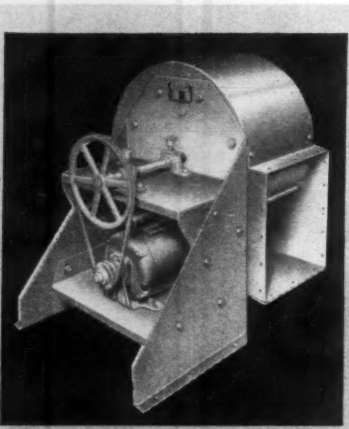
★ B&G Model CFG Shell and Coil Condensers



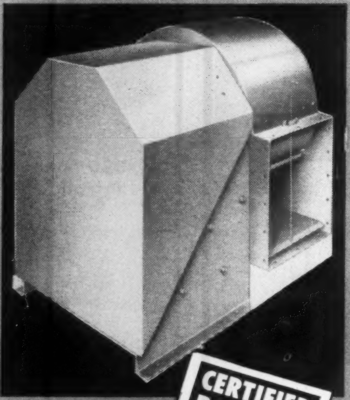
★ B&G Model LRS Liquid Receivers

★ B&G Series RG Heat Exchangers

B&G Evaporators



ALADDIN UTILITY SETS



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BELT DRIVEN

SELF CONTAINED

QUIET OPERATING

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ALADDIN Belt-Driven Utility Sets are extremely quiet in operation. Designed for general ventilation, they occupy a minimum of space, handling large volumes of air at low noise levels. They are ruggedly built and are ideally suited for roof installation... when furnished with weatherproof cover they require no further protection against the weather.

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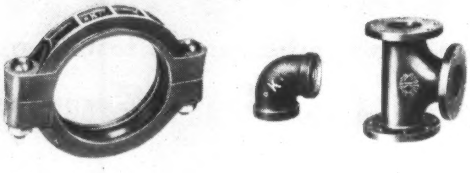

Ductile Iron Fittings . . .

. . . in new line including "K" pipe lock couplings, screwed and flanged fittings, companion flanges—*Kuhns Bros. Co., Dept. HPAC, 1800 McCall St., Dayton 1, Ohio.*

Fittings are said to have high strength, ductility, pressure tightness. Are lighter for applications where weight is important factor, says company. Also have corrosion resistance feature of ductile iron.

Gravity Roof Ventilators . . .

. . . in new weatherproof line—*Leslie Welding Co., Inc., Dept. HPAC, 2943 W. Carroll Ave., Chicago.*

Includes rotary turbine, stationary and revolving head types in variety of sizes. Made of galvanized steel, units are designed for maintenance-free operation under all weather conditions, says company. In industrial and light construction models.

Coupling, Expansion Joint . . .

. . . combination, together with fittings, for plastic, aluminum pipe—*American Flow Control Corp., Dept. HPAC, 2220 South Blvd., Houston.*

Uses o-ring and simple locking device, says company. Is said to permit maximum, minimum of expansion, contraction as requirements demand. Designed to make possible replacement of any section of pipe in matter of minutes without use of tools.

Extended Baseboard Diffusers . . .

. . . featuring larger capacities—*Lima Register Co., Dept. HPAC, Lima, Ohio.*

"Super 72" recommended by company for air con-

1957

EVERY DAY OF THE YEAR YOU CAN DEPEND ON AIR CONTROL PRODUCTS

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
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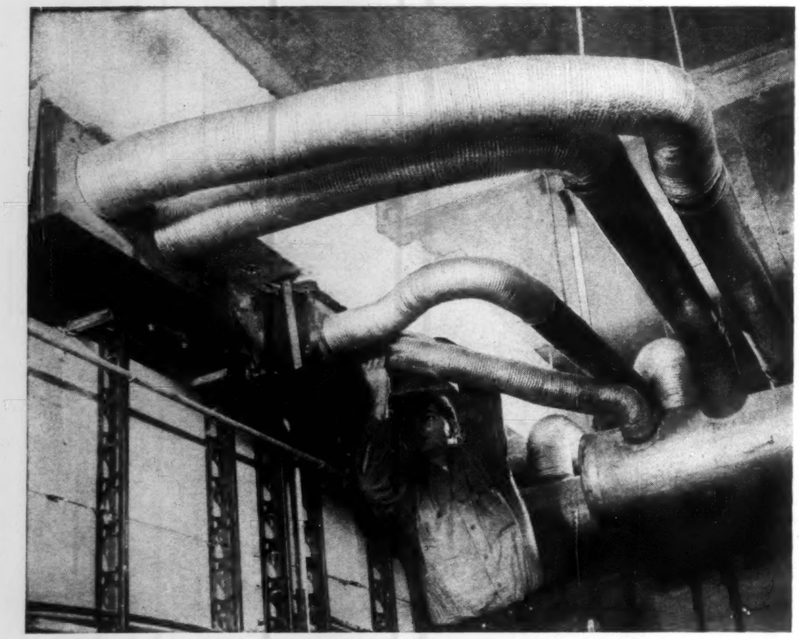

Whether it's a hot or cold air system, or both, you will find that you will save time and money when you use Thermaflex® high or low pressure flexible ducting as a connector to snake around bends and obstructions. You can forget about special elbows or costly connectors, for when you use Thermaflex one man, without special tools, can make the necessary connections in a matter of seconds.

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Thermaflex is engineered to provide excellent air flow characteristics and provides a minimum friction loss in bending around obstructions.

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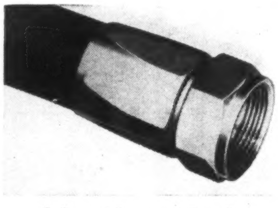
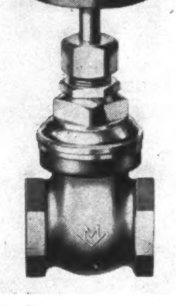
ditioning installations using baseboard supply outlets. Four ft size has capacity for commercial installations. For large areas such as stores, offices, churches and factories, diffusers can be connected in multiples required by using joining connectors.



Reusable Hose Ends . . .

. . . for use where medium high pressure, cotton covered, single wire braid hose is required—*Weatherhead Co., Ft. Wayne Div., Dept. HPAC, 128 W. Washington Blvd., Ft. Wayne, Ind.*

Designed to permit close coupling to conserve space. Threads match SAE and JIC standards in variety of sizes. Recommended by company for application in air lines, fuel lines, hydraulic lines, grease and oil lines, LP gas transfer lines.



Gate Valve . . .

. . . with nonrising stem design—*Milwaukee Valve Co., Dept. HPAC, 2375 S. Burrell St., Milwaukee.*

"Model No. 101" is "streamlined" version of company's heavy duty type units. Specifications, capacities include: 125 lb, SWP; 200 lb, WOG. Is nonshock type with solid wedge disc, brass construction.

There is good reason why *Thor electric drills* give you more quality and power at less cost

Silver Line Screwdriver and Nutsetter, in 13 models and 3 job-rated clutch systems.

¼" Right Angle Drill, available with standard chuck or optional collet.

IN the interest of production efficiency, Thor engineers long ago learned that interchangeability of basic power tool parts cuts end-of-line costs. This saving permits Thor to build more quality into each tool and its attachments. Now, a basic tool can have attachments that provide industry with 400 different job-rated tools . . . each one answering your need for quality, power and lowest maintenance cost.

One such electric tool is the Silver Line ¼" Drill. Here is an example of *more* power: 25% more than other standard drills. Here is an example of *quality:* heavy-duty ball bearings throughout, bridged support for heavy-duty Thor-built armature bearing maintains alignment for positive accuracy and long wear.

Available in seven speeds to fit the specific drilling job. This Thor Silver Line ¼" Drill is a perfect one-hand tool, especially for close-quarter and overhead work.

Let the experience of satisfied users around the world prompt you to get complete information from your Thor electric tool distributor

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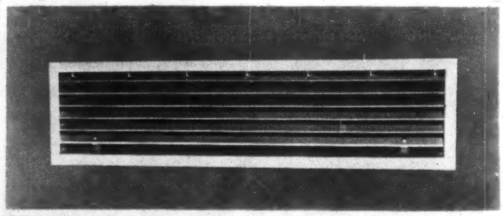
EQUIPMENT DEVELOPMENTS

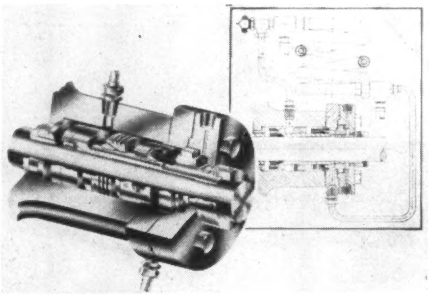
Continued



Air Diffuser Units . . .

. . . for use with high temperature-differential systems —*Anemostat Corp. of America, Dept. HPAC, 10 E. 39th St., New York 16.*

In two series: "SL-100" induces approximately 100 cfm of room air for each 100 cfm of prime air; "SL-ASP" induces about 40 cfm of room air for each 100 cfm of prime air. For ceiling, wall, under the window, or sill applications. Both units available in variety of sizes, lengths.



Mechanical Seal . . .

. . . for high pressure boiler feed, other high temperature water services—*Crane Packing Co., Dept. HPAC, Morton Grove, Ill.*

Designed to provide longer service life, cut replacement costs and downtime. Once installed, seal needs no further attention, says company. Special closed circulating system is said to effect long seal life. Seal comes engineered for particular operation, including adaptation to pump design and piping arrangement.

Portable pH Recorder . . .

. . . for field surveys, in-plant studies—*Bristol Co., Dept. HPAC, Waterbury 20, Conn.*

Requires no external power supply. Recommended by company for field surveys of stream pollution, waste treatment plant effluent, industrial water supplies. Device designed to cover total pH range 0-14 in two partial ranges 0-8, 6-14.

Regrinding Swing Check Valve . . .

. . . in 10 sizes ¼ to 3 in. in pressure ratings 150WSP/300WOG and 200WSP/400WOG—*Ohio Brass Co., Dept. HPAC, Mansfield, Ohio.*

B&G PRESENTS...

three new or improved units for better boiler protection

B&G SYSTEM SAVER

Complete protection for hot water boilers

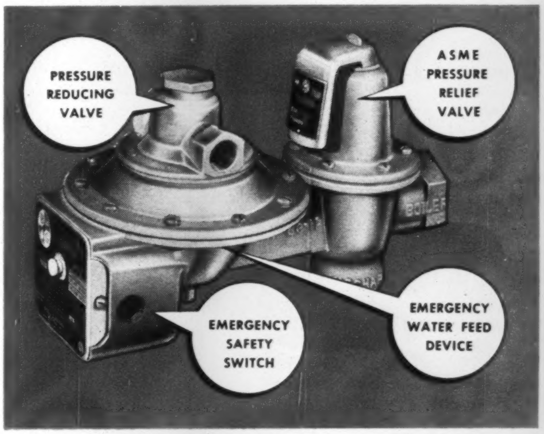
Four utility and safety devices combined in a single, easy-to-install unit.

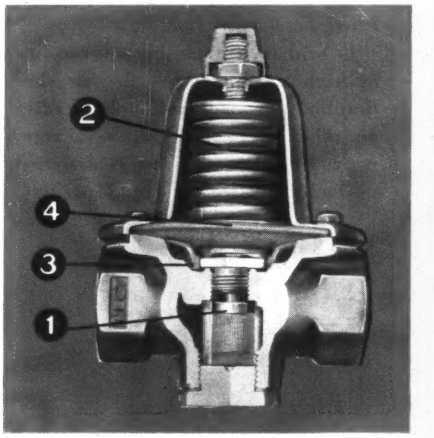
1. Automatically fills the system. *Pressure Reducing Valve* maintains water pressure in the system at all times, minimizing troubles caused by air in the system.

2. Automatically prevents excessive boiler pressures. *ASME Pressure Relief Valve* is designed to exceed ASME Code requirements! Resilient Silicone valve face assures tight seal.

3. Automatically shuts off burner. *Emergency Safety Switch* breaks electrical current if other controls fail. Switch must be re-set before operation can resume.

4. Automatically adds cooling water to boiler. *Emergency Water Feed Device* opens pressure reducing valve wide to keep boiler full of water if burner fails to shut off below 260°F.





ANTI-SIPHON FEATURE ON ALL B&G REDUCING VALVES

An entirely new design principle prevents backflow of water when city water pressure drops below system pressure.

In normal operation, when valve seat **(1)** is forced down by spring **(2)** because of low system pressure, water flows in through the valve seat. To enter the system, water must first pass under the flexible sealing lips of the Anti-siphon Check Valve **(3)**.

In case of low city water pressure, the pressure on the inside of the Anti-siphon Check Valve (city water side) is less than the outside pressure (system water side). This outside pressure forces the lips of the Anti-siphon Check Valve against the main diaphragm **(4)** preventing backward flow of water from the system.

LARGER SIZES OF ASME RELIEF VALVES

The *plus value* features of B&G ASME Relief Valves are now available in 3,000,000 and 4,000,000 BTU units.

These valves are diaphragm operated. This construction transmits more power during opening and closing cycles, hence heavier, stronger springs can be used.

Diaphragm construction also establishes a new low differential of not to exceed *three pounds* between opening and closing pressures. B&G Relief Valves are *wide open* when the pressure is increased just a little above that required to open the valve. Resilient, heat resistant Silicone rubber valve seats assure no leakage when valve is closed.

SYSTEM SAVER
4-1
Relief and Reducing Valves

Send for descriptive literature on these three additions to the B&G line of Hydro-Flo Heating Products.

BELL & GOSSETT COMPANY
Dept. EQ-5, Morton Grove, Illinois
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When **HEAT** or **CORROSION** Add to Your Pressure Piping Problems . . .

Protect Pipe Joints with . . . W-S

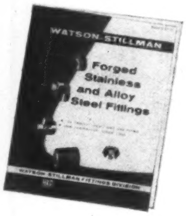
FORGED STAINLESS or ALLOY STEEL FITTINGS

IN CORROSIVE SERVICE your pipe joints take a beating—fluid velocity and turbulence accelerate corrosion wherever there is a change in direction of flow.

AT HIGH TEMPERATURES structural changes in the metal can cause loss of strength and subsequent failure.

Those are good reasons for "playing it safe" in high pressure service with W-S Forged Stainless or Alloy Steel Pipe Fittings. W-S Stainless Fittings resist corrosion in a wide variety of process liquids and gases and high temperature steam. Available in Types 304, 316 and 304 L.

W-S Alloy Steel Fittings resist oxidation and graphitization and retain their high strength in high pressure—high temperature steam lines. Three alloys available—1¼% Chrome-½% Molybdenum and 2¼% Chrome-1% Molybdenum and 4-6% Chrome-½% Molybdenum.



W-S Forged Stainless and Alloy Steel Fittings can be obtained in Screw-End Type for 2,000 lb., 3,000 lb., and 6,000 lb. WOG service; Socket-Welding Type for Schedules 40, 80, 160 and Double-Extra Heavy Pipe. Send today for bulletin S-1-55.

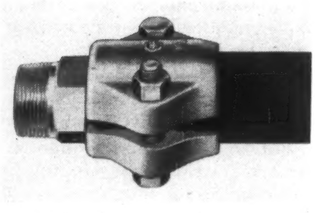
Write to W-S Fittings Division, H. K. Porter Company, Inc., P.O. Box 95, Roselle, N. J.

HKP W-S FITTINGS DIVISION
H. K. PORTER COMPANY, INC.

EQUIPMENT DEVELOPMENTS

Continued

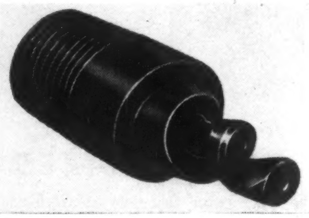
Body cast from bronze alloy. Other parts brass rod or bronze alloy. Two side plugs make hinge pins readily accessible from either side for easy removal of disc holder when valve is mounted close to wall or other obstruction, says company.



Hose End . . .

. . . with clamp type construction—*Weatherhead Co., Ft. Wayne Div., Dept. HPAC, 128 W. Washington Blvd., Ft. Wayne, Ind.*

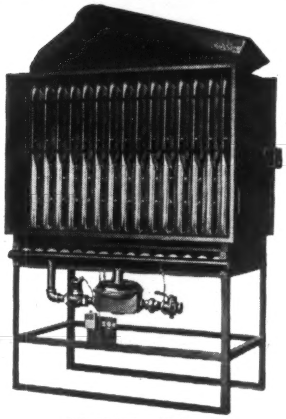
Is said to provide high versatility in high pressure lines for air, hydraulic fluids, steam. Couples readily on other types of hose, says company. Of malleable iron, is designed to facilitate free flow and positive, long lasting seal. Available in sizes ¼ to 2 in.



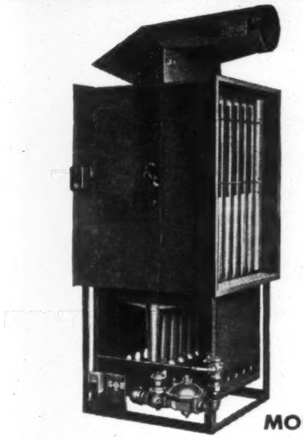
Fog Nozzles . . .

. . . of hard rubber construction—*Bete Fog Nozzle, Inc., Dept. HPAC, 309 Wells St., Greenfield, Mass.*

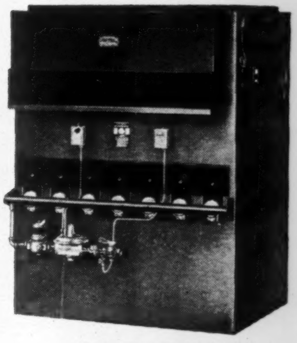
Are said to be nonclogging, corrosion resistant, long wearing, inexpensive. Recommended by company for use where corrosive conditions make use of other materials impractical. Cited feature is one-piece, spiral design. In 10 models with narrow or wide angle hollow cone spray pattern in five different flow rates, 5 to 50 gpm. Connections are ⅜ and ½ in. male pipe thread.



MODEL SED-E



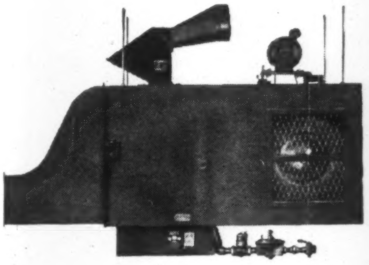
MODEL SED-S



MODEL SED-VF

MODEL SED-E — Non-corrosive type 321 stainless steel heat exchanger. Permits installation downstream of cooling equipment, for continuous blower operation. Air throughput in either direction. 80,000 to 600,000 Btu input.

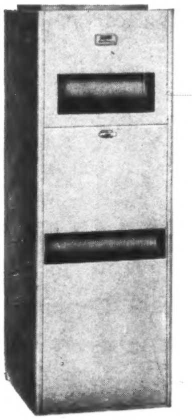
MODEL SED-S — Same as SED-E except controls are at the side, instead of at the end where accessibility requires either SED-E or SED-S is available in sizes from 80,000 to 600,000 Btu input in increments of 40,000 Btu.



MODEL SEU

MODEL SED-VF — Tested and approved as a duct furnace; type 321 stainless steel. Re-circulated or fresh air enters through bottom, sides, or back. Built-in air bypass, vent in front. Sizes from 70,000 to 245,000 Btu input.

MODEL SEU — Suspended unit heater. Recirculates room air. Diffuser outlet with adjustable vertical and horizontal vanes. Double inlet forward curve blower. Continuous duty, variable pitch drives, raised port burners. 80,000 to 600,000 Btu input.



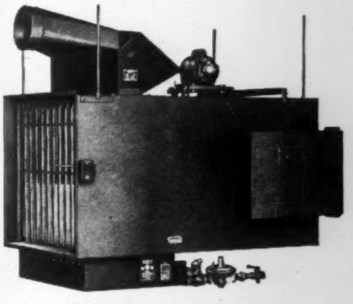
MODEL SEC

HAYES

FURNACES

outstanding for
commercial, industrial,
schools, churches,
theaters, large residential

HAYES FURNACE MFG. & SUPPLY CO.
3233 So. La Cienega Blvd., Los Angeles 16, California
Telephone TExas 0-3734



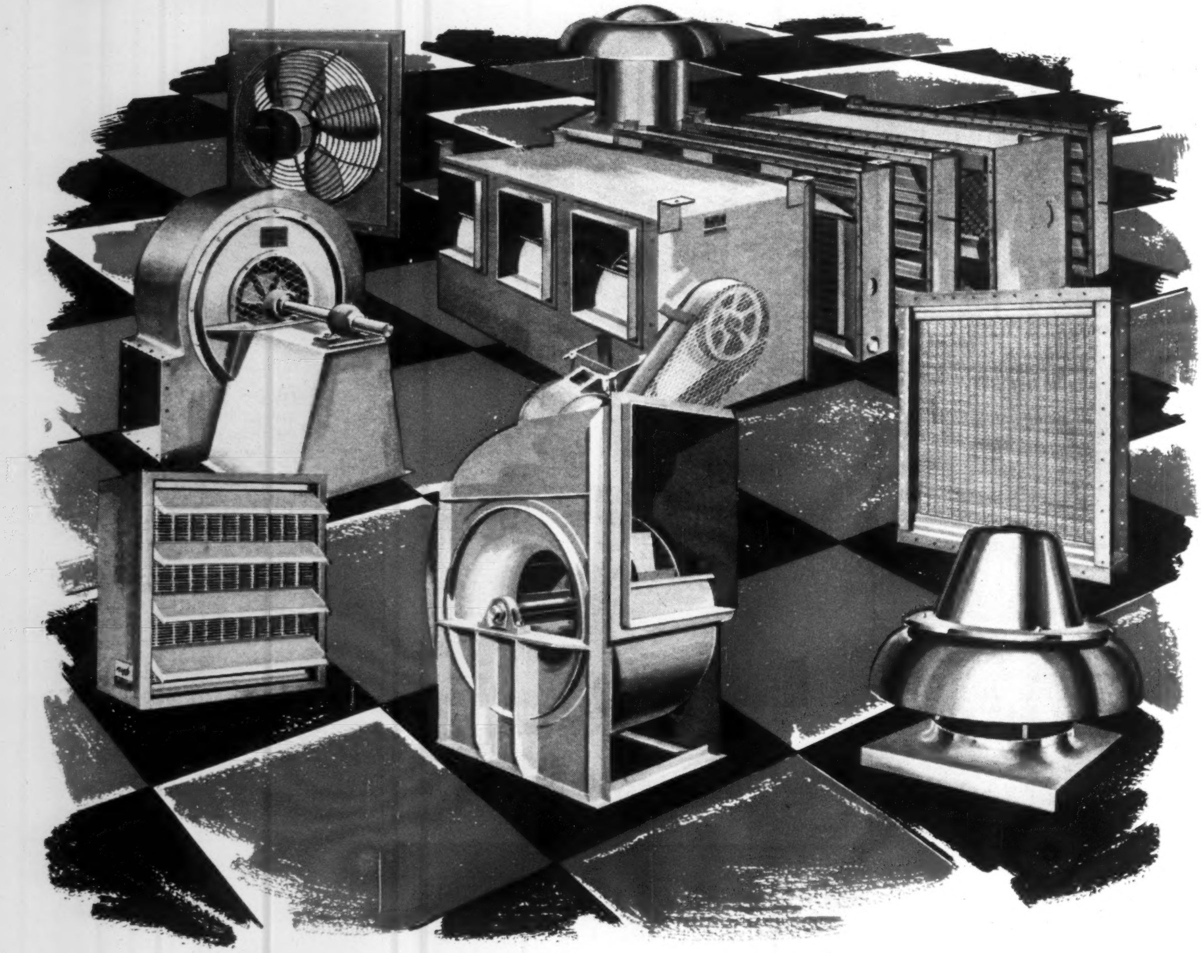
MODEL SES

MODEL SEC — Forced air furnace. Stainless steel heat exchanger sections seam and arc welded. One piece cast iron burners with drilled ports. Oversize double inlet blower, glass or washable filters. 6 sizes — 70,000 to 245,000 Btu input. For zero clearance.

REPRESENTATIVES

M. Blazer & Son, Passaic, New Jersey.
Blue Flame Supply Company, Atlanta, Georgia
Eugene Bolstad, Edmonton, Alberta, Canada.
E. B. Bomar, Phoenix, Arizona.
Boyd Engineering Co., El Paso, Texas.
Reube O. Emery, Nashville, Tennessee.
F & D Distributors, Salt Lake City, Utah.
Leudecke Engineering Co., Austin, Texas.
McCombs Supply Co., Denver, Colorado.
O'Connor-Oklahoma Co., Oklahoma City, Tulsa, Oklahoma & Wichita, Kas.
Smith Steam Specialty Co., Kansas City, Mo.
Tay-Holbrook, Inc., San Francisco, California.
F. R. Young, Housten, Texas.
Dealers Supply Company, Atlanta, Georgia.
Jewell & Company, Hot Springs, Arkansas.
Nunn Electric Co., Lubbock, Texas.
Neland & Co., Newport News, Va.
Temp-Control Corp., Portland, Oregon

MODEL SES—Forced air, suspended furnace for installation in suspended duct system. Inlet and outlet designed for sheet metal duct connection. Double inlet forward curved blower. Continuous duty variable pitch drives, raised port burners.

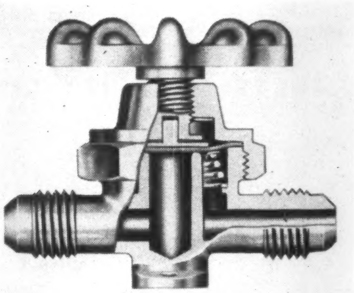


it's your move . . .

Skill and judgment always come to mind when seeing a checkerboard. And this same skill and judgment is vitally necessary when solving your air handling problems. Unsurpassed for adaptability to an extremely wide range of requirements, **nyb** products provide your assurance of efficient, economical performance in virtually any application. Strong, compact units are your assurance of dependable, continuous service all year 'round. It's *your* move to make the *right* move by selecting **nyb** now as your source of supply.

nyb **THE NEW YORK BLOWER COMPANY**

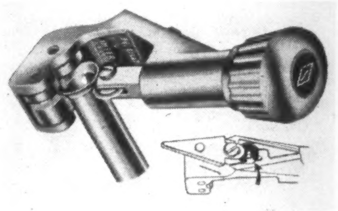
SALES OFFICES: 3149 SOUTH SHIELDS AVENUE • CHICAGO 16



Diaphragm Packless Valve . . .

. . . engineered for unrestricted flow—*Henry Valve Co., Dept. HPAC, 3215 North Ave., Melrose Park, Ill.*

Available in $\frac{1}{4}$ to $\frac{5}{8}$ in. flare and ODS sizes. For refrigeration service, charging boards, gage shutoff valves and vacuum applications; also for control of various industrial fluids, other applications requiring small, compact valves. Is said to be lightweight without sacrificing strength.



Tube Cutter . . .

. . . with concealed spare wheel—*Imperial Brass Mfg. Co., Dept. HPAC, 1200 W. Harrison St., Chicago 7.*

"Hi-Duty" unit has spare cutting wheel recessed behind reamer. Unit designed for use with copper, steel, aluminum tubing $\frac{1}{8}$ to 1 in. OD. Cited features: free wheeling ball action, retractable reamer, flare cutoff groove for removing damaged flares with minimum of waste, concealed feed mechanism.

Room Air Conditioners . . .

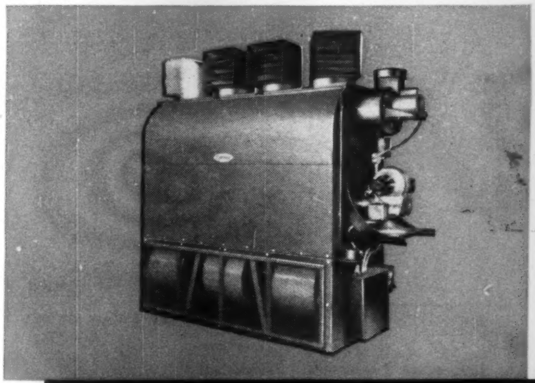
. . . designed to require less electric current—*Carrier Corp., Dept. HPAC, Syracuse 1, N.Y.*

Are said to produce full cooling capacity at standard conditions. New $\frac{3}{4}$ hp unit requires only $7\frac{1}{2}$ amperes, says company.

Equipment Briefs . . .

HUMIDIFIER engineered to provide "positive" humidification—*Walton Laboratories, Inc., Dept. HPAC, 1186 Grove St., Irvington 11, N.J.* "Model WF" produces water vapor mechanically by means of

CARRIER ANNOUNCES A NEW SOURCE OF LOW-COST HEAT



Heat Diffusers, Direct Fired, a complete heating system in a single package

Here from Carrier is a new source of low-cost heat for stores, garages, schools, factories, churches, warehouses: Heat Diffusers, Direct Fired, for use with gas or oil.

These compact Heat Diffusers are completely self-contained: a stainless-steel combustion chamber, burner, heat interchanger, air handling equipment and controls are all assembled in a single casing.

They cut heating costs three ways:

1. They cost less to own because they do the job of several smaller type units.

2. They cost less to install because no central boiler is required; saving piping costs.

3. They cost less to operate because of their high efficiency—at least 80% of the fuel consumed is converted into usable heat.

Further advantages are great flexibility and ease of installation. They can be floor mounted, ceiling mounted, wall mounted, or installed with ducts. They are pre-wired and factory-fired; when electrical and fuel connections are made and the stack vented, a unit is ready to operate. Available in 10 sizes, 300,000 to 2,000,000 Btu's.

For your copy of a new bulletin describing this new heater in detail, call the Carrier Manufacturer's Agent listed in your Classified Telephone Directory under "Heaters—Unit." Or write Carrier Corporation, Dept. UH, Syracuse, New York.

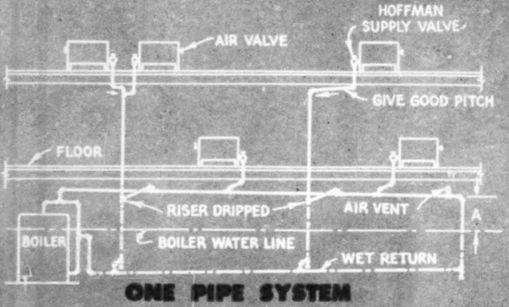
Carrier

industrial heating • air conditioning • refrigeration

HOFFMAN

A COMPLETE QUALITY LINE...

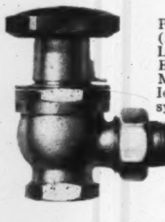
No. 1A RADIATOR STEAM VENT VALVE
Adjustable vent ports, non-vacuum. Size conn.: ⅛". Max. oper. press. 10 P.S.I.



For either one-pipe or two-pipe steam, residential or industrial systems there's a Hoffman Trap, Valve, Pump or other specialty designed to give you better control of every requirement.

No. 75 STEAM MAIN VENT VALVE
Single Port float seals the port when water is encountered. Size conn.: ¾" male, ½" female. Max. oper. press.: 10 P.S.I.

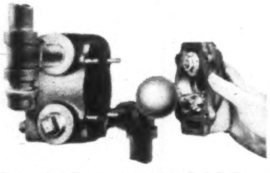
No. 186 STEAM SUPPLY VALVE



Packless valve (Bellows Type). Low Pressure. Brass Body. Modulating. Ideal for vacuum systems.

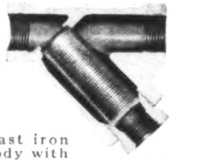
Sizes ½" through 1½".

50 SERIES F&T TRAP



Operating Pressures to 125 P.S.I. Cap. from 70 to 12,000 lbs. of C.P.H. Cover which can be removed without breaking piping connections. Sizes ¾" to 2".

400 SERIES DIRT STRAINER



Cast iron body with brass perforated cylinder. Made in ½" through 3" pipe sizes. Max. press. 250 P.S.I. Can also be furnished with monel or stainless steel screens.

HOFFMAN SPECIALTY MFG. CORP., 1700 West 10th Street, Indianapolis 7, Indiana

EQUIPMENT DEVELOPMENTS

Continued

centrifugal atomizer. Evaporates 10 gal per day of water. Requires only water, blower connections.

HOLE SAW KIT designed for use by pipe fitters, piping contractors—*Henry G. Thompson & Son Co., Dept. HPAC, New Haven, Conn.* Contains six welded edge saws ranging ¾ to 2½ in. in diameter for standard pipe sizes ½ to 2 in. diameter, two arbors with steel pilot drills, 12 in. extension.

PASTE TYPE FLUX for high temperature brazing of stainless, other high alloy steels—*Wall Colmonoy Corp.,* 19345 *John R. St., Detroit* 3. Formulated to clean and promote wetting of surfaces to be joined, help dissolve oxides during brazing action. Applied by spreading, brushing, dipping or by any mechanized method, says company.

TIME SWITCHES for control of heating, air conditioning systems—*International Register Co., Dept. HPAC,* 2624 *W. Washington Blvd., Chicago* 12. For control of circuits from periods of 2 sec to 24 hr. "V21000" seven-day unit used for controlling systems on weekly schedule.

CIRCUIT BREAKERS with new 700 and 800 ampere continuous current ratings—*General Electric Co., Trumbull Components Dept., Dept. HPAC, Plainville, Conn.* Ratings available for L-frame molded case units in two-pole, three-pole designs for applications to 600 volts, a-c, or 250 volts, d-c.

RECORDING POTENTIOMETERS for use with analog-to-digital conversion devices—*Bristol Co., Dept. HPAC, Waterbury, Conn.* Designed to give full scale traverse in 0.4 sec. For digital read-out of temperature, pressure, flow, differential pressure, pH, smoke density, etc.

ELECTRIC VIBRATING PEN for marking, engraving, etching ferrous or nonferrous metals—*Newage International, Inc., Dept. HPAC,* 222 *York Rd., Jenkintown, Pa.* "Actograp" produces short, powerful, continuous arc by means of magnetic vibrating system, thus enabling user to etch rapidly, easily on hard metals, says company.

PREFORMED SOLDERS available in any shape, size—*Alpha Metals, Inc., Dept. HPAC,* 56 *Water St., Jersey City.* Offered as washers, rings, coils, cut shapes, pellets, solder foil. Shapes can be had in rosin filled solder, acid cored solder, single core, solid wire and sheet solder.

SWITCH with actuators integral with switch body—*Unimax Switch, Div. of W. L. Maxson Corp., Dept. HPAC, Ives Rd., Wallingford, Conn.* Feature is said to facilitate ease of installation, maintenance of factory-set switch characteristics. Single pole,

STEAM HEATING SPECIALTIES

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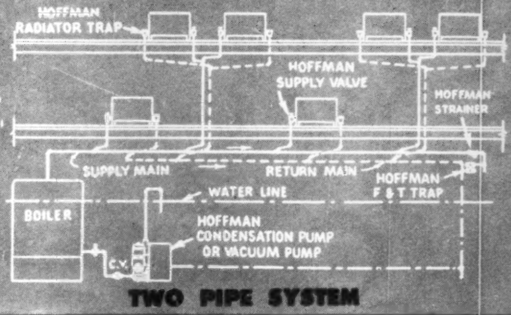
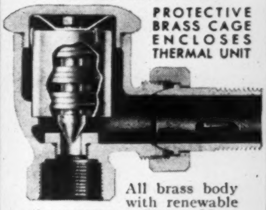
Each Hoffman product is distinguished by exclusive features that assure customer satisfaction and long, care-free service. This complete tested quality line is backed by a dependable, single source of supply and responsibility.

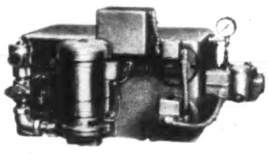


THERMOSTATIC TRAPS



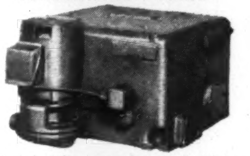
All brass body with renewable thermostat and seat. Max. oper. pressure from 25 through 125 lbs. Capacities from 200 through 1250 lbs. condensate per hour.

VACUUM PUMPS



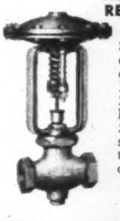
Jet Type Vacuum Producer used for most effective means of simultaneously removing air and water. Receiver is of heavy cast iron. Capacities 2,500 to 100,000 sq.ft. E.D.R.

CONDENSATION PUMPS



Designed for operation at the higher pressures encountered in condensation pump service. All submerged parts are of bronze or other noncorrosive material. Cap. from 1,000 to 150,000 Sq. Ft. E.D.R.

No. 710 PRESSURE REDUCING VALVE



Single seated for continuous or dead end service. Max. high press. 250 lbs. per sq. in. Low pressure range 5 to 80 lbs. per sq. in. Sizes ½" through 1½" inclusive.

600 SERIES INVERTED BUCKET TRAP

Operating press. to 200 P.S.I. Cap. 600 to 11,000 lbs. C.P.H. All working parts connected to bonnet. Sizes ½" through 1½".

Sold by leading wholesalers of heating and plumbing equipment.

EQUIPMENT DEVELOPMENTS

Continued

double throw unit rated 5 amperes 125/250 volts a-c.

PHENOLIC LIQUID ADHESIVE formulated to produce high shear strengths—*Minnesota Mining and Mfg. Co., Adhesives and Coatings Div., Dept. HPAC,* 411 *Piquette Ave., Detroit* 2. Recommended by company for honeycomb structures, metal-to-metal bonding. Service temperature range is −65 to 180 F.

INSTRUMENT CASES in standard line of drawn aluminum models —*Instrument Cases, Inc., Dept. HPAC,* 510 *Garfield St., Glendale* 4, *Calif.* Available in transit, instrument, combination case types. Offered in variety of sizes.

PORTABLE HOIST-TRIPOD designed for firm, easy setups on ramps, platforms, rough ground without "digging in" uphill leg—*B. E. Wallace Products Co., Dept. HPAC, Exton* 20, *Pa.* Telescopic legs adjust by 6 in. steps. Designed to resist rust. Includes screw-in "spike," nonskid pad. Handles to 3 tons.

CEILING CLIP, GUARD COMBINATION designed to provide powder-actuated stud driver users with fast, inexpensive method to fasten suspended loads, grids, structures—*Remington Arms Co., Inc., Dept. HPAC, Bridgeport, Conn.* Clip is inserted directly into guard and stud is driven through clip into base surface. Studs designed for steel, concrete applications available.

HARDSURFACING FLUX for use with submerged arc welding process to produce hardsurfacing deposit using mild steel electrode—*Lincoln Electric Co., Dept. HPAC,* 22801 *St. Clair Ave., Cleveland* 17. "H-560" is agglomerated mixture of fluxing materials, alloys which are said to make high carbon, high alloy weld deposit when used with company's "L-60" mild steel automatic electrode wire.

MASONRY DRILL KIT designed to speed up installing jobs requiring anchor bolting to brick, stone, concrete block—*Super Tool Co., Dept. HPAC,* 21650 *Hoover Rd., Detroit* 13. "Super Junior" is pocket sized plastic box containing four carbide tipped spiral bits in four most popular sizes. Recommended by company to builders, maintenance men.

PIPE JOINT COMPOUND with maximum temperature rating boosted to 750 F, pressure to 5000 psi—*Lake Chemical Co., Dept. HPAC,* 3052 *W. Carroll Ave., Chicago* 12. "Pipetite-Stik" recommended by company for use on plastic as well as metal threads on lines carrying water, steam, gas, refrigerants, oxygen, butane, propane, brine, etc. Shaped like large crayon, is applied by rubbing across male threads. ‡

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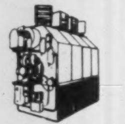
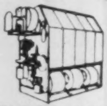
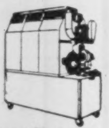


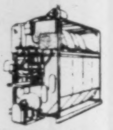
Model H — vertical unit with discharge heads. 12 sizes



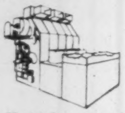
Model D — vertical unit for duct work 12 sizes



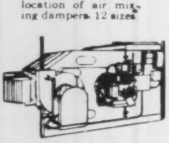
Model P — portable, vertical unit for flexible duty. 6 sizes



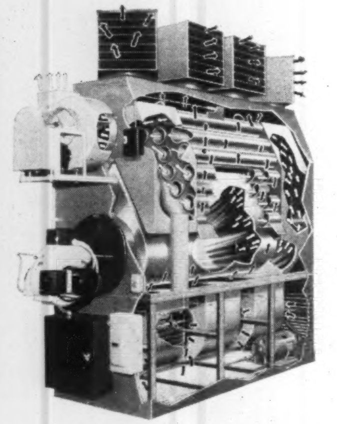
Model R — inverted unit with discharge heads at bottom 12 sizes



Model S — vertical unit with side blowers to permit proper location of air mixing dampers. 12 sizes



Model C — horizontal ceiling suspension unit for space saving. 12 sizes.



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Let National Heater Company show you how space heating and ventilating problems can be solved **efficiently** and **economically.** No matter how large or small a plant may be, National Champion Heaters **save** money on installation, operation and maintenance.

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DIRECT FIRED HEATERS

6 Models 66 Sizes
400,000 to 2,000,000 BTU's
Automatic Operation
PLUS Year-Round VENTILATING!

Direct-fired for gas, oil and combination fuels
Approved by American Gas Association. Listed by UL

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NO OBLIGATION! MAIL THIS COUPON TODAY!

NATIONAL HEATER CO., Inc., 2475 Doswell St., St. Paul 9, Minn.

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We're interested in knowing more about National Heaters as noted below:

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RECENT TRADE LITERATURE...

▶ *ADHESIVES*—New 11 page technical bulletin gives engineering data on epoxy resin adhesives for metal to metal bonding, honeycomb sandwich construction. Literature contains information on five types. *Minnesota Mining and Mfg. Co., Dept. HPAC, 423 Piquette Ave., Detroit* 2.

▶ *AIR CONDITIONING EQUIPMENT*—1957 products bulletin illustrates company's line of air conditioning equipment including "punkah" louvers, drum "punkah" louvers, translucent diffusers, custom designed diffusers, "Thermo-Reg" units. *Thermotank, Inc., Dept. HPAC*, 11191 *Lappin Ave., Detroit* 34.

▶ *AIR FILTER*—New 8 page bulletin No. 175 describes company's "Automatic" air filter. Contains drawings illustrating principles of operation, installation procedure. Includes filter capacity and size selection chart. *Green Fuel Economizer Co., Inc., Dept. HPAC, Beacon, N.Y.*

▶ *AIR MIXING UNITS*—New air mixing units for use in dual duct air conditioning systems covered in bulletin DD-3. Described are "V3" and "Type H" model mixing units, "VD" air distribution header. *Buensod-Stacey, Inc., Dept. HPAC*, 45 *W.* 18*th St., New York* 11.

▶ *ALUMINUM*—New 16 page bulletin lists sizes, weights of rod, bar, sheet, coil, plate, tubular, building products of aluminum carried in company's steel service plants in New York, New England. Guide to selection and data on cutting facilities, finished and mechanical properties included. *Joseph T. Ryerson & Son, Inc., Dept. HPAC, Box* 184, *Jersey City* 3; *Box* 1111, *Boston* 3; or *Box* 188, *Wallingford, Conn.*

▶ *ALUMINUM WELDING CABLE*—Bulletin No. TL-201 tells "Do's" and Don'ts" of use of aluminum welding cable. Contains hints on use to increase circuit efficiency, lower maintenance costs, eliminate weldor fatigue. *Tweco Products, Inc., Dept. HPAC, P.O. Box* 666, *Wichita* 1, *Kan.*

▶ *BLAST COIL HEATERS*—Bulletin E-97P is newly revised, enlarged catalog on "Indeeco" blast coil heaters for use in packaged air conditioners. Lists 13 makes of air conditioners, over 454 varieties of blast coil heaters. *Industrial Engineering and Equipment Co., Dept. HPAC*, 24 *Hanley Ct., St. Louis (Brentwood)* 17, *Mo.*

For EVERY HEATING and AIR CONDITIONING NEED

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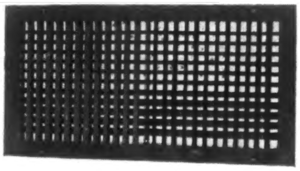
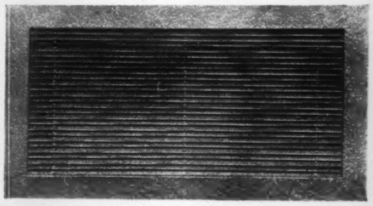
A-J

REGISTERS · GRILLES · DIFFUSERS · ACCESSORIES



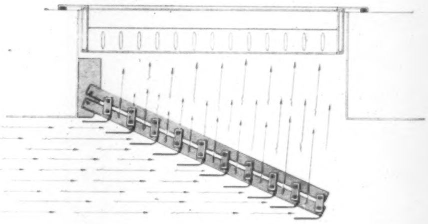
Model 400 VH, air conditioning grilles; exclusive features, include extruded aluminum vanes, individually adjustable; slide action, spring load tension foils tampering, accidental change of flow pattern; wrap-around frame gives greater strength, easier installation; concealed mechanism stops air leaks; vertical, horizontal or combination louver arrangement. Wide size range available.



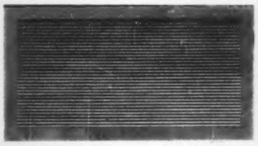
Model 77 B, thin core grilles; core only or with telescoping frame which fastens to Grille with Posts and screws. Easy installation in doors and partitions 1/4" to 3/4". Cuts installation time 1/2.

Model 44, volume control damper; order separately or as part of Model 400 VH Grille (above). Accurate air flow metering; simultaneous action moves louvers in opposite directions; gear drive; no "dead spots"; allows system balancing without grille removal.

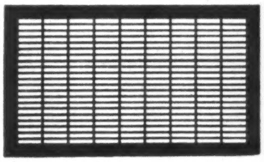
Model 88, extractor, maximum control for any heating, ventilating, cooling system, stops turbulence; increases efficiency of outlet; easy to install and adjust.

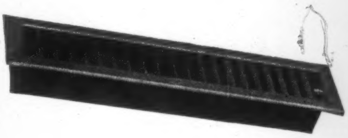


Model 75 B, Dark Room grille, light-proof, sight-proof; flange or channel frame, steel louvers on 1/3" centers; maximum free area; wide range of sizes.



Architectural Grilles, blend beautifully with traditional or modern interiors; wide range of finishes and sizes.





Model 55, perimeter diffusing register; heavy gauge curved vanes factory set for uniform flow-pattern; special lock screw assures permanent system balance; ideal for wall outlet in high-velocity system.

INSPECT THIS EQUIPMENT AT

THE 13th INTERNATIONAL HEATING & AIR CONDITIONING EXPOSITION

SEE THESE NEW DEVELOPMENTS IN GRILLES & REGISTERS . . .

Model 7000, All new no-vision grille in extruded aluminum.

Shallow stock depth design now standard on Model 430 and 435 registers.

New No. 450 and 4500 Return Air grilles with 45° downward deflection.

CHICAGO INTERNATIONAL AMPHITHEATER
Feb. 25 to March 1, 1957

Booth 621-623

A·J MANUFACTURING CO.

Dept. H-1
3601 East 18th Street
KANSAS CITY 27, MISSOURI

Free Catalog

Shows complete line of grilles, registers, diffusers.

Mail This Coupon *Now* . . .

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Rush my copy of your catalog of grilles, registers & diffusers.

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Firm ....
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City .... State ....

"Customer Acceptance"

Keeps 'em rolling!

TITUSVILLE

Scotch Marine BOILERS

The greatest customer-acceptance in Titusville's many years of Scotch Marine boiler manufacture requires shipments by the trainload to satisfy! The reason is an ever-wider appreciation of Titusville as a BETTER BOILER BUY. The developments and refinements found in our Scotch Marine boilers today are the fruit of longest experience and largest volume manufacture of this famous boiler type—steady progress that pays off in *value* to every user. Write for quotations on the capacity you require.

THE TITUSVILLE IRON WORKS CO.

BOILER DIVISION
BOILERS for Power and Heat . . . High and Low Pressure . . . Water Tube . . . Fire Tube . . . Package Units
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Crystallizers . . . Direct Fired Heaters . . . Evaporators . . . Heat Exchangers . . . Mixing and Blending Units . . . Quick Opening Doors . . . Special Carbon and Alloy Processing Vessels . . . Synthesis Converters
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Crankshafts . . . Pressure Vessels . . . Hydraulic Cylinders . . . Shafting . . . Straightening and Back-up Rolls
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MACHINERY for Sheet and Structural Metal Forming . . . Tangent Benders . . . Folding Machines . . . Roller Table and Tumble Die Bending Machines . . . Press Brakes . . . Punching and Notching Machines . . . Forming Dies

A Division of
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TITUSVILLE, PENNSYLVANIA
Manufacturers of A Complete Line of Boilers for Every Heating and Power Requirement
Plants at Titusville, Pa. and Warren, Pa.
Offices in Principal Cities

RECENT TRADE LITERATURE

Continued

▶ *BOX FURNACES*—Bulletin GEC-1402, 4 pages, includes specifications, temperatures, ratings, dimensions of box type furnaces with cooling chambers for low production and laboratory applications. *General Electric Co., Dept. HPAC, Schenectady* 5, *N.Y.*

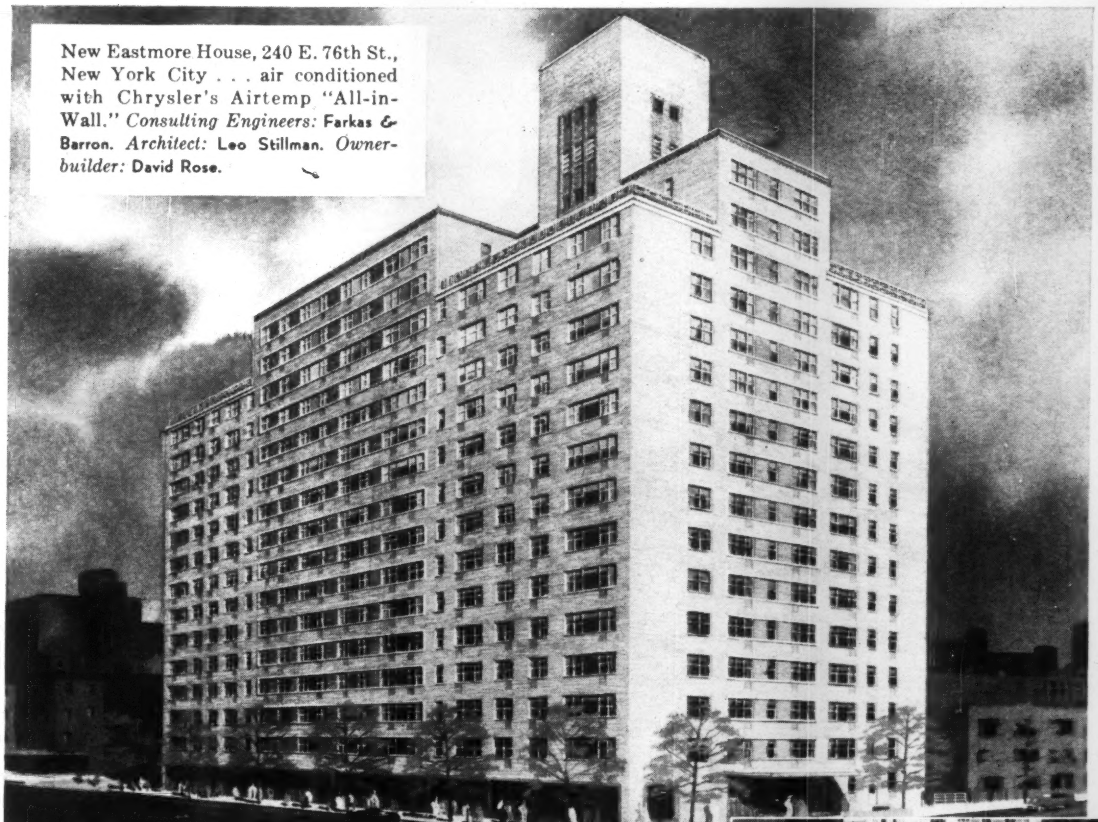
▶ *BRAZING*—*Production Brazing* is title of nine page reprint of paper delivered at 1956 meeting of International Institute of Welding. Examines modern brazing procedures, production costs. *Eutectic Welding Alloys Corp., Dept. HPAC,* 40-40 172*nd St., Flushing* 58, *N.Y.*

▶ *BRAZING ALLOYS*—High temperature brazing alloys for brazing stainless steel and variety of heat resistant alloys described in 4 page bulletin 22. Literature gives specifications, selection factors, recommended applications, other pertinent data on four "Handy Hi-Temp" alloys. *Handy & Harman, Dept. HPAC,* 82 *Fulton St., New York* 38.

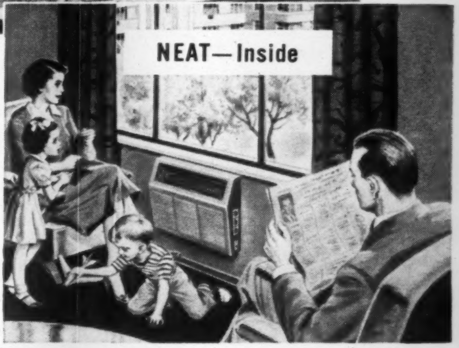
▶ *CAUSTIC SODA*—New 40 page manual, *Caustic Soda Engineering and Handling Guide,* includes diagrams, photographs of tank cars, piping, storage equipment, together with recommendations for unloading, dilution, transfer, storage. Also contains graphs, charts, tables covering physical data on liquid caustic soda itself. *Hooker Electrochemical Co., Dept. HPAC, Box* 344, *Niagara Falls, N.Y.*

▶ *CENTRIFUGAL FANS*—New design in backward curved airfoil centrifugal fans presented in 64 page bulletin A-103. Fans in five classes with diameters ranging 13½ to 168 in. *Chicago Blower Corp., Dept. HPAC,* 9863 *Pacific Ave., Franklin Park, Ill.*

▶ *CIRCUIT BREAKERS*—Bulletin No. 3411 covers general purpose circuit breakers of hydraulic-magnetic type. Describes principle, design, op-



New Eastmore House, 240 E. 76th St., New York City . . . air conditioned with Chrysler's Airtemp "All-in-Wall." *Consulting Engineers:* **Farkas & Barron.** *Architect:* **Leo Stillman.** *Owner-builder:* **David Rose.**



Cool each room separately with efficient, low-cost

Airtemp "All-in-Wall"

With Airtemp's "All-in-Wall" air conditioner, each occupant regulates his own thermostat, and, if desired, pays for the air conditioning used.

The "All-in-Wall" is simple to install. It doesn't project from the building. And all three models—½, ¾, and 1 h.p.—have the same size cabinet.

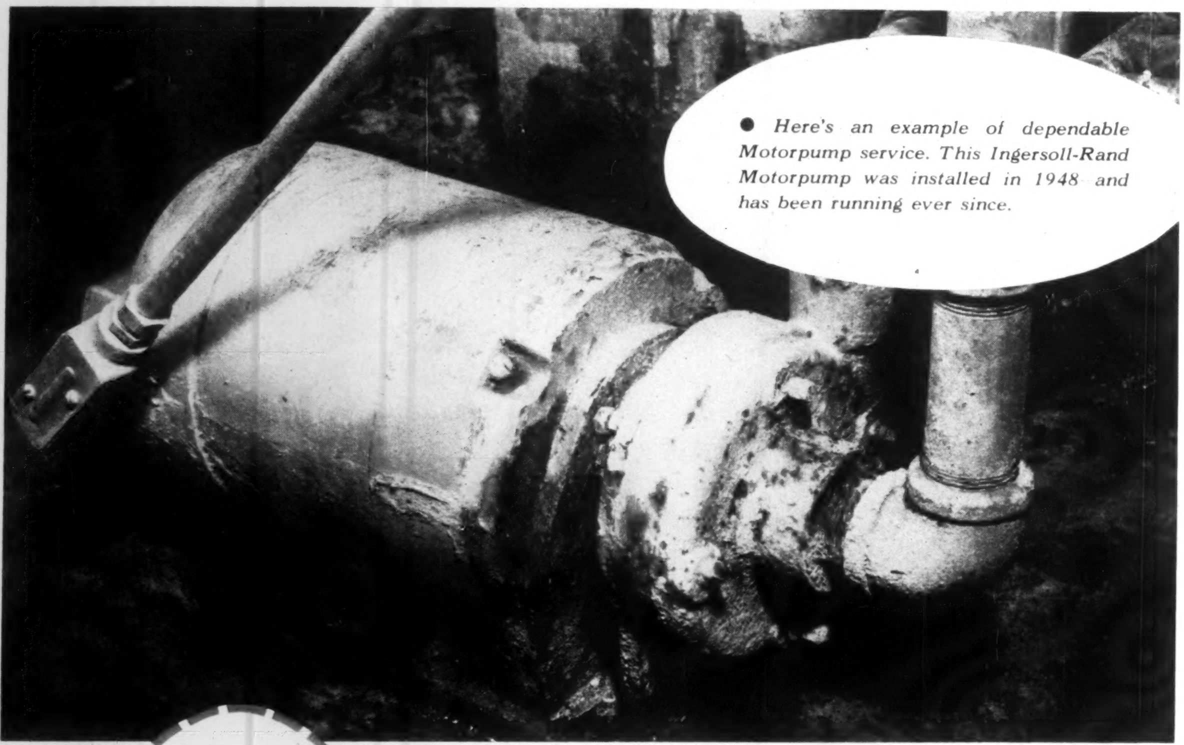
Airtemp air conditioning includes 286 models—the broadest line in the industry . . . central, "packaged," and evaporative-cooling systems. Airtemp features Chrysler engineering—your guarantee of full rated cooling capacities . . . efficient, trouble-free operation.

FLUSH—Outside

Airtemp
CONSTRUCTION
DIVISION OF
CHRYSLER CORPORATION

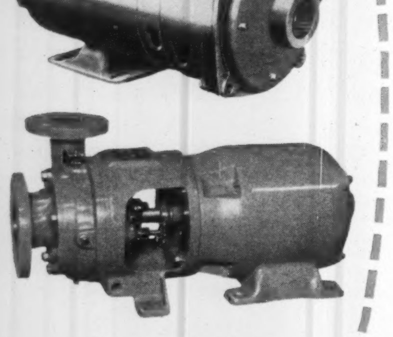
PHONE your nearest Airtemp contractor. He's in the Yellow Pages. Or write to Airtemp Construction Division, Chrysler Corporation, Dayton 1, Ohio

A CHRYSLER DIVISION SPECIALIZING IN AIR CONDITIONING FOR EVERY HOME AND BUSINESS NEED



● *Here's an example of dependable Motorpump service. This Ingersoll-Rand Motorpump was installed in 1948 and has been running ever since.*

Texas installation proves LONG LIFE, LOW MAINTENANCE OF MOTORPUMP



One of the big reasons why Ingersoll-Rand's Motorpump is specified as an integral part of so many air conditioning systems is its compact, rugged design and trouble-free operation. Motorpumps are built to give efficient, low-cost operation—and here is just one instance where performance paid off many times over:

> The 1 hp, 3 phase Motorpump was installed in Corpus Christi, Texas in 1948 on a 5-ton air conditioning system. It has outlasted one compressor unit and one tower, and they've had to replace piping. Existing records and the pump's appearance indicate that there has been no maintenance. It is still in operation.

If you'd like other interesting examples proving the outstanding service advantages of I-R Motorpumps, get in touch with your nearby Ingersoll-Rand representative or write to Ingersoll-Rand, Cameron Div., 11 Broadway, New York 4, N. Y.

- ***Sizes up to 75 hp***
- ***Compact, space-saving***
- ***Operate in any position***
- ***Simple installation***

Ingersoll-Rand

9-408

PUMPS · CONDENSERS · TURBO-BLOWERS · COMPRESSORS · ROCK DRILLS
VACUUM EQUIPMENT · AIR & ELECTRIC TOOLS

eration, application. Schematic diagrams, time delay curves, other engineering information included. *Heinemann Electric Co., Dept. HPAC, 497 Plum St., Trenton 2, N.J.*

▶ *CIRCULAR SCALE INDICATORS*—Specification S1001-1 describes 3½ in. concentric dial "Tel-O-Set" indicators. Primarily intended for use on graphic panels, are useful in applications where small-sized circular scale indicators are needed, says company. *Minneapolis-Honeywell Regulator Co., Industrial Div., Dept. HPAC, Wayne and Windrim Aves., Philadelphia 44.*

▶ *COLD GALVANIZING COMPOUND*—"Drygalv" cold galvanizing compound formulated to rustproof iron and steel surfaces, prevent corrosion at welded joints, repair damaged galvanized surfaces is illustrated, described in 4 page folder. *American Solder & Flux Co., Dept. HPAC, 19th and Willard Sts., Philadelphia 40.*

▶ *COMBUSTION CHAMBERS*—"Jet Line" combustion chambers covered in 8 page mailing piece. Circular contains information, specifications on 18 standard chamber sizes (0.60 to 12 gph). *Grant Wilson, Inc., Dept. HPAC, 141 W. Jackson Blvd., Chicago 4.*

▶ *CONDUIT*—"Therm-O-Tile" conduit for underground piping detailed in 12 page booklet. Literature contains cutaway drawings, photographs, table of dimensions. Conduit designed to be permanent, economical, simple, efficient. *H. W. Porter & Co., Inc., 825 Frelinghuysen Ave., Newark 12, N.J.*

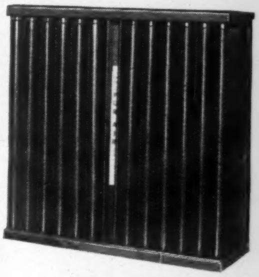
▶ *CONTINUOUS BLOWDOWN SYSTEM*—Bulletin 65 cities economy, automatic features and provides table of limits of boiler concentrations for company's continuous blowdown system. Contains drawings

"Cleanest, purest air of any public auditorium in the world . . ."

Air Purification and Cost Savings

DALLAS AUDITORIUM GETS BOTH with ACTIVATED CHARCOAL FilterFolds

Activated Charcoal air purification provides two big benefits—either one of which is reason enough to include it in your next job. First, the purification itself—positive removal of all odors, stuffiness or air pollution, internal or external. Second, the substantial savings on heating or cooling by maximum recirculation of inside air purified by FilterFolds.



The Dallas Civic Auditorium, shown above, has a unique air conditioning system, providing the cleanest, purest air of any public auditorium in the world. Big reason for this is the use of 212 Activated Charcoal FilterFolds. Easily installed in the duct work, they purify 218,430 c.f.m.

Cleaner air was a contributing factor in using Activated Charcoal FilterFolds in the Dallas Auditorium, the FilterFolds also meant lower installation costs, and will mean lower operating costs. You can ventilate with charcoal-purified air without the necessity of re-heating or re-cooling large amounts of outside air.

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world's largest producer of air recovery activated charcoal

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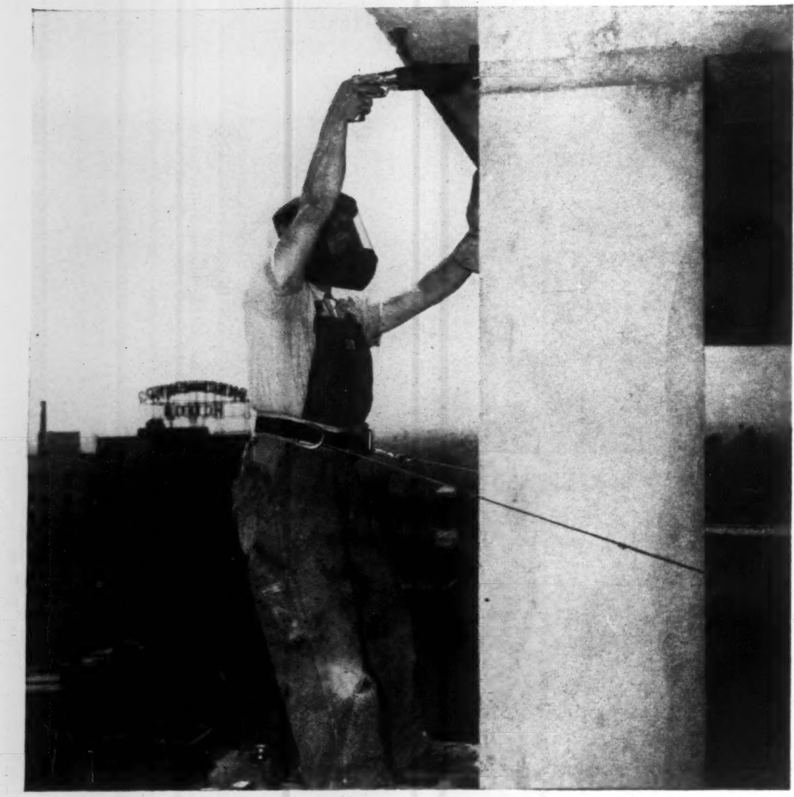

If you can reach it,
you can fasten it
with Ramset®

One-hand operation in awkward places is simple with a light RAMSET powder-actuated tool. It's ideal for ladder and scaffold work.

For anchoring to concrete or steel, the new DUO-JOBMASTER® sets ¼" and ⅜" fasteners interchangeably—merely by switching barrels right on the job! Yet the tool does not change size or weight!

There's no need to exert physical power when you use RAMSET. Let the power charge do the work! No wires, no hose to drag or untangle. RAMSET is entirely self-contained.

Tough jobs are now easy with RAMSET. No more drilling, filling, plugging and bolting. RAMSET fasteners are set at the press of the trigger—have greater holding power than old-style methods.

Speed your production, make work easier for operators, cut your costs, get more dependable performance by using RAMSET whenever fastening to concrete, steel or other hard materials.

Write for free new catalog, ready for you now.

companion tool

Shure-Set
TRADEMARK

Baby brother to RAMSET, this hammer-in tool uses no cartridge, but makes your own hammer power more effective. For masonry, mortar joints, cinder block. Ask for literature.

Ramset Fastening System
WINCHESTER-WESTERN DIVISION
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RECENT TRADE LITERATURE

Continued

showing system complete with operating components, controls. Illustrates components individually and lists their physical details. *Whitlock Mfg. Co., Dept. HPAC, West Hartford 10, Conn.*

▶ *CONTROL VALVES*—Bulletin LB-2, 12 pages, gives details on construction, operating characteristics of "Series LB" control valves in sizes 1 to 4 in. Tells how valve body, topworks combination affords greater power, higher sensitivity, faster speeds of response, less installation and maintenance costs, says company. Includes specifications, valve sizing data. *Conoflow Corp., Dept. HPAC,* 2100 *Arch St., Philadelphia* 3.

▶ *CONTROLS*—Control manual insert No. 5 contains looseleaf revisions to automatic controls manual issued previously. Includes new catalog F 1753-5 covering controls for heating, air conditioning. Check list provided for keeping manual up-to-date. *Barber-Colman Co., Dept. HPAC, Rockford, Ill.*

▶ *COOLING TOWERS*—New 12 page bulletin 477-A describes 24 sizes of "quiet operating" cooling towers for business and industry. Dimensions, approximate weights given for units which range 5 to 360 tons of refrigeration. Selection tables for range of design wet bulb conditions also included. *Cooling Equipment Div., Binks Mfg. Co., Dept. HPAC,* 3122 *Carroll Ave., Chicago* 12.

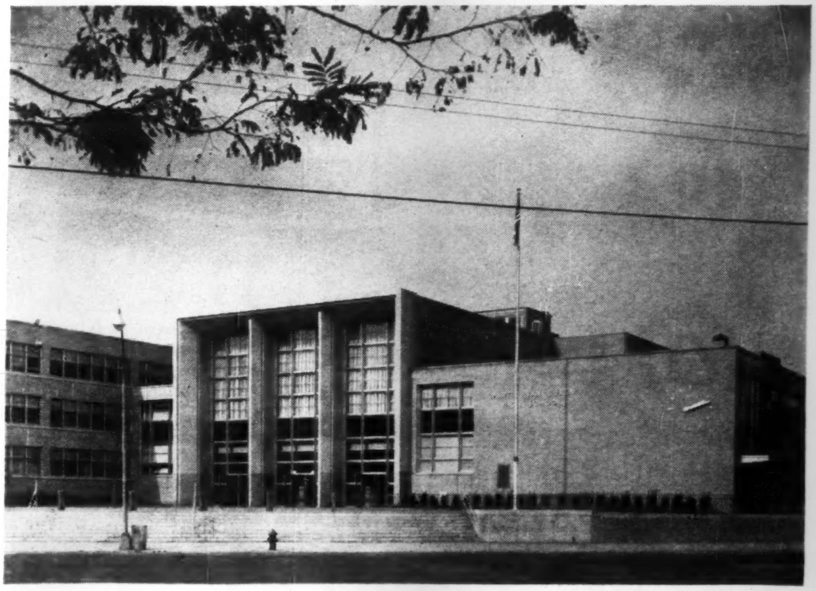
▶ *COPPER ALLOYS*—Tabulation of nonstandard, wrought copper base alloys available. List provides trade name, generic name, nominal composition, forms available, typical applications, mill source for each alloy. *Copper & Brass Research Association, Dept. HPAC,* 420 *Lexington Ave., New York* 17.

▶ *CORROSION RESISTANT EQUIPMENT*—New 32 page cata-

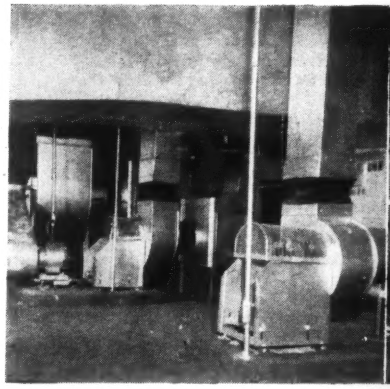
"MASSACHUSETTS goes to school"

A conventional design school showing Massachusetts fan installations, as a contrast to our recent "Banjo School" ad. These two schools present an interesting comparison, in that marked differences are numerous, such as open courts, corridor intersections, stairs and traffic to and from all activities.

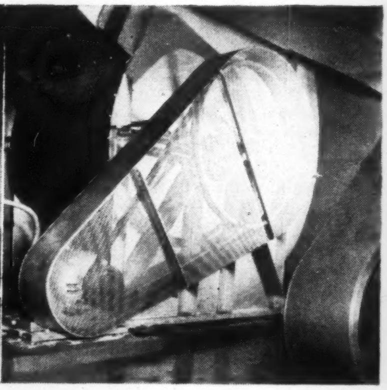
Having 39 class rooms, this school accomodates 3100 pupils, auditorium seats 1200, 1100 cafeteria, 4,676,000 cubic feet, 314,780 square feet.



Martin Van Buren High School, Queens, New York



THERE ARE THIRTEEN FANS IN THIS ROOM. A TOTAL OF THIRTY-SEVEN MASSACHUSETTS FANS SERVICE THE ENTIRE SCHOOL.



AUDITORIUM SUPPLY AND EXHAUST FANS ARE MASSACHUSETTS SQUIRREL CAGE TYPE WITH 65-¾" DIAMETER WHEEL.

EGGERS & HIGGINS
Architects
WEISKOPF & PICKWORTH
Structural Engineers
SYSKA & HENNESSY
Mechanical Engineers
CARISTO CONSTRUCTION CORP.
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DANIEL J. RICE, INC.
Heating & Ventilating Contractors

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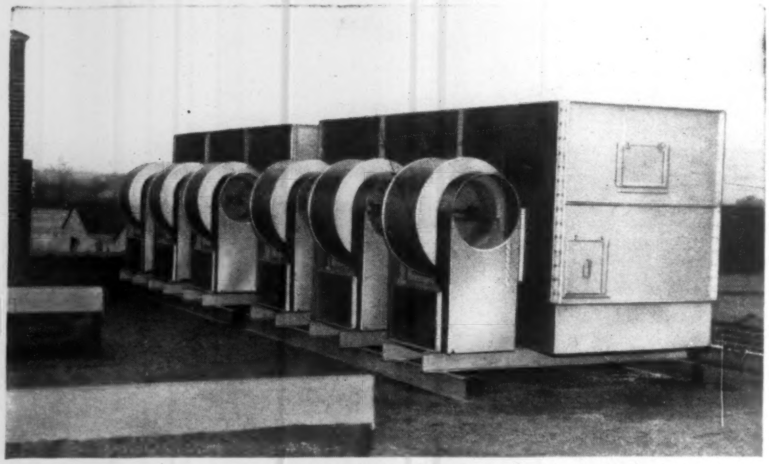
MASSACHUSETTS BLOWER DIVISION
The BISHOP & BABCOCK Mfg. Co.
4901 HAMILTON AVENUE · CLEVELAND 14, OHIO



These low and compact Binks Series 3-B forced draft cooling towers do an efficient job of cooling process water for the Johnston Foil Manufacturing Co., St. Louis, Mo.

At Johnston Foil Manufacturing Co.

Binks cooling towers cut water bill 75%

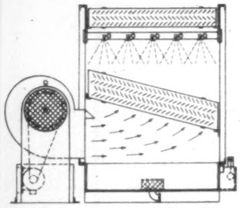
As producers of aluminum, tin and lead foil, Johnston Foil uses water ...and lot's of it...to cool the foil mill and drying rolls. Before installing Binks cooling towers, city water was used on a one-pass basis. Now water is recycled and the heat dissipated by two, triple-blower Type-B cooling towers. Only make-up water is required.

Compare these construction features—Johnston Foil did.

Whisper-quiet operation. Squirrel cage blowers have tip speeds only ⅓ that of propeller-type fans.

Low silhouette. Over-all height of largest capacity tower is only 7'6"—they're seldom visible at street level.

High Efficiency. Binks patented Roto-jet spray nozzles plus internal redwood nailless decking assure thorough water breakup. Scientifically balanced air-to-water ratio gives high cooling efficiency under all climatic conditions.



Cross-section showing counter-flow air-water movement employed in Binks Series 3-B towers.

Minimum maintenance. Blowers and motors are outside the tower—not in the moisture-laden air stream. All panels are heavily galvanized. Outsides of towers have two coats of aluminum paint—insides, a tough, durable zinc chromate coating.

For full information on Binks complete line of mechanical and natural draft cooling towers, write direct to the address below. Binks engineers will gladly study your needs and help you select the right tower for your particular requirements.

647

Binks
EVERYTHING FOR WATER COOLING

Visit us in BOOTH 1172

INTERNATIONAL HEATING & AIR-CONDITIONING EXPOSITION

A COMPLETE LINE OF NATURAL DRAFT AND MECHANICAL DRAFT COOLING TOWERS AND INDUSTRIAL SPRAY NOZZLES

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3118-38 Carroll Ave., Chicago 12, Ill.
REPRESENTATIVE IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED ☎ DIRECTORY

RECENT TRADE LITERATURE

Continued

log C-14 details corrosion resistant plastic equipment including pipes and fittings, valves; fume ducts and fume systems; tanks, towers and accessory supplies; heat exchangers; pressure and vacuum equipment; agitators. Describes range of synthetic resin formulations. *Haveg Industries, Inc., Dept. HPAC, 900 Greenbank Rd., Wilmington 8, Del.*

▶ *CUTTING OIL*—"Sunicut 85," new transparent heavy duty cutting oil, recommended by company for production threading of high alloy steel tubing, described in technical bulletin 48. *Sun Oil Co., Dept. HPAC, 1608 Walnut St., Philadelphia 3.*

▶ *CUTTING, THREADING MACHINES, SAWS*—Line of cutting and threading machines and saws detailed in 6 page catalog. Complete technical data included. Close-up photographs show special features, operation of all machines. *Collins Machinery Corp., Dept. HPAC, 5474 Alhambra Ave., Los Angeles.*

▶ *DIAPHRAGM CONTROL VALVE*—Bulletin 980 covers "Type 30" diaphragm control valve designed to provide accurate pressure reduction, regulation of steam, water, air, oil, brine, most liquids and gases. Includes information on sizes, specifications and dimensions, pressure and temperature ratings, capacities, optional accessories. *A. W. Cash Co., Dept. HPAC, P. O. Box 551, Decatur, Ill.*

▶ *DUCT INSULATION SPECIFICATIONS*—Data sheets on writing of insulation specifications for heating, air conditioning duct systems are designed as reference aid to mechanical engineers. Sheets detail approved specifications for attaching, finishing semi-rigid duct insulation. *Baldwin-Hill Co., Dept. HPAC, Trenton 2, N. J.*

LEADING AGAIN IN '57!

. . . look over this broad line and see why

Waterloo
AIR DIFFUSION EQUIPMENT

"Since 1902"

is your best source for all air diffusion equipment

FOR USE IN

- Schools
- Churches
- Hospitals
- Hotels
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- Medical Centers
- Office Buildings
- Theaters
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- Industrial Buildings

The Waterloo Register Company has been a leader in the development of air diffusion equipment, particularly in the commercial field, since the inception of air conditioning and ventilation. Since 1902 it has proven its outstanding performance features, intrinsic modern styling and quality construction. Waterloo's exclusive adjustable "tear drop" louvre design assures efficient operation, preventing excessive turbulence, noise or loss of energy. We are grateful to the many leading architects, engineers and contractors who, by specifying WATERLOO for their finest structures, have placed it among America's favorites.

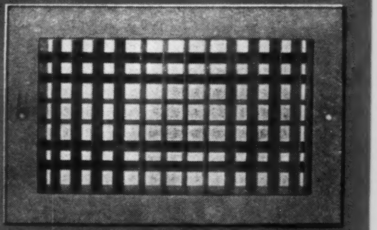
Special Facilities for Unusual Service

When you're on the spot, WATERLOO'S exceptional delivery service permits meeting exacting production schedules. During the past year our production facilities have been still further expanded — new items have been added — to further increase our ability for unusual services on quality equipment.

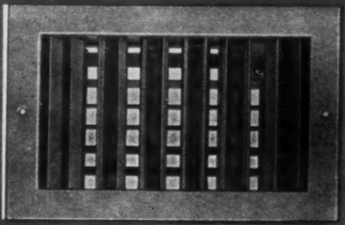
HEAVY DUTY RETURN AIR GRILLE

We cordially invite you to visit our display booth 1337 when attending the International Heating & Air Conditioning Exposition in Chicago February 25 to March 1, 1957.

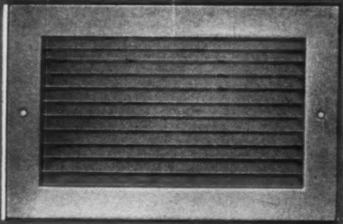
WATERLOO REGISTER CO., Inc.
P. O. BOX 72 WATERLOO, IOWA, U. S. A.



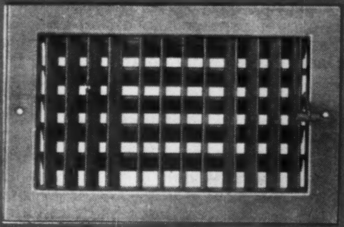
2V SUPPLY GRILLE



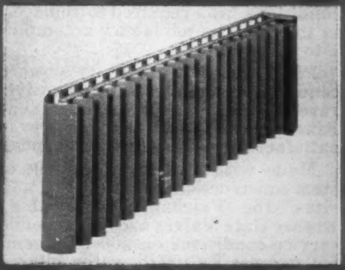
2VO SUPPLY REGISTER



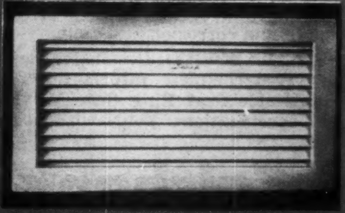
3H RETURN AIR GRILLE



IVMH SUPPLY REGISTER

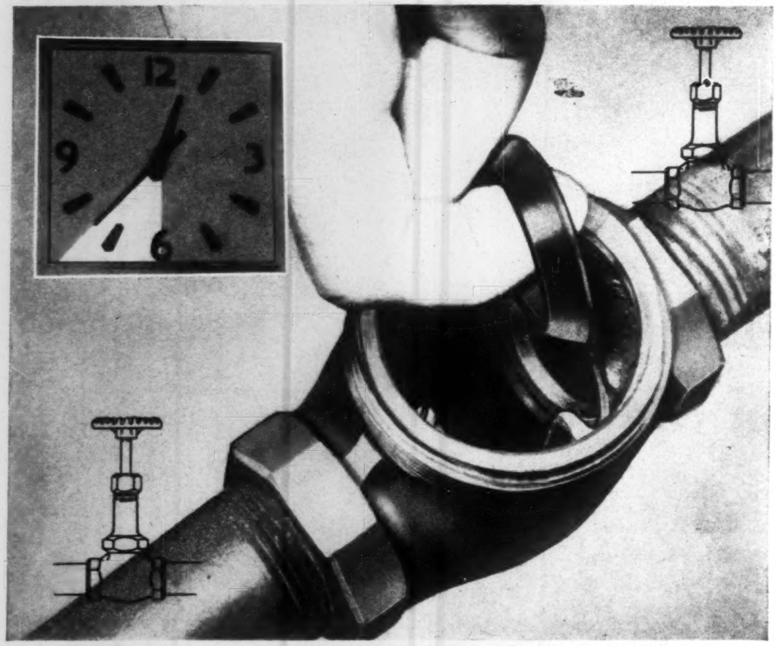


DUCTROL AIR VOLUME EXTRACTOR



DV DOOR GRILLE

Only 7 to 10 Minutes to Renew Service Life of New Gate Valve



Patented development assures replacement of seat ring while valve remains installed.

Without removing the valve body from the line, you replace the nickel-alloy seat rings in Fairbanks new patented Renewable Seat Ring Gate Valves. In 7 to 10 minutes, from the time the line is shut down until it is put back into operation, you have given a new service life, a new life of dependable tight closure to your valve.

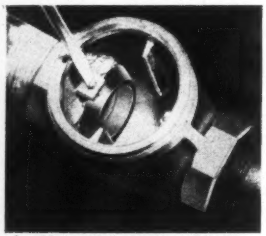
Just 7 to 10 minutes of your maintenance man's time — only 7 to 10 minutes of "downtime" on your steam, water or process piping lines — and you have the equivalent of a new valve in the line. Think of the savings: where once at least one hour, under the most ideal conditions, was required to replace a gate valve in the line, the job is now accomplished in from 7 to 10 minutes.

Field tested for over two years, under all conditions from steam to corrosive liquids, the revolutionary new Fairbanks Renewable Seat Ring Bronze Gate Valve has proven completely satisfactory — absolutely dependable.

Made with either rising stem or non-rising stem construction in ½",¾",1", 1¼",1½" and 2" sizes, the Fairbanks Renewable Seat Ring Bronze Gate Valves are recommended for severe service conditions on 200 lb. steam pressure at 550 degrees F., 400 lb. water, oil or gas pressure — non-shock — lines requiring full flow and subject to frequent operation. Nickel alloy seat rings and wedge make the valves particularly tough and corrosion resistant.

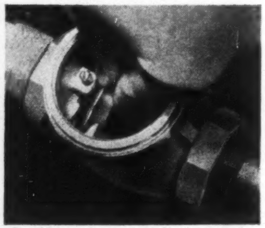
YOURS ON REQUEST: Illustrated, descriptive folder gives complete information on Fairbanks Renewable Seat Ring Gate Valve with details and specifications. Yours without charge. Write today.

THE **Fairbanks** COMPANY
393 Lafayette Street, New York 3, N. Y.
Branches:
New York 3 • Boston 10 • Pittsburgh 22 • Rome, Ga.
Valves • Trucks • Casters • Wheels • Dart & "PIC" Unions



1. Union Bonnet removed. Retaining screw loosened with ordinary screwdriver.

2. Finger hooks inside nickel alloy seat ring. Seat ring lifts out of valve body.



3. New seat ring is inserted. Retaining screw tightened. Bonnet replaced.

RECENT TRADE LITERATURE

Continued

▶ *ELECTRIC TOOLS* — New 32 page 1957 catalog (No. 104) describes 69 portable electric tools and kits with over 400 accessories. Recommended by company to industrial maintenance men, heating and air conditioning contractors. 10c per copy. *Porter-Cable Machine Co., Dept. HPAC, 93 Exchange St., Syracuse 8.*

▶ *FANS*—"Axial Airfoil" fans covered in 20 page brochure. Literature describes each of company's eight models with dimensional charts, performance tables, certified ratings, operational descriptions. Fans have air moving capacities 1200 to 100,000 cfm. *Chicago Blower Corp., Dept. HPAC, 9863 Pacific Ave., Franklin Park, Ill.*

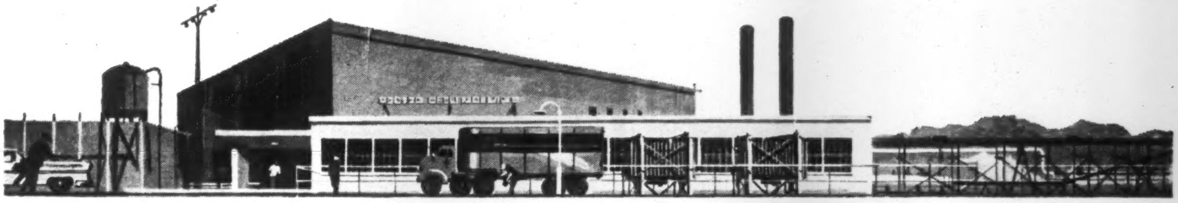
▶ *FASTENING DEVICES* — Four page mailing piece contains illustrations, descriptions, specifications, price information for company's line of plastic screw anchors, other fastening devices, also masonry drills, hand drills. *Holub Industries, Inc., Dept. HPAC, Sycamore, Ill.*

▶ *FITTINGS*—New 118 page publication C-12RS is reference to sizes, weights, roughing-in dimensions of range of "Anaconda" copper tube fittings. Included are wrought copper, wrought copper refrigeration, cast brass, cast brass for drainage, brass fittings for flared tubes, cast brass valves, flange fittings. *American Brass Co., Dept. HPAC, Waterbury 20, Conn.*

▶ *FLEXIBLE AIR DUCT*—Two new data sheets deal with use of flexible air duct in air conditioning installation. Each data sheet is case history of actual installation. *Wiremold Co., Dept. HPAC, Hartford 10, Conn.*

▶ *FLEXIBLE COUPLINGS*—"Morflex" couplings detailed in 24 page

MODERN BUSINESS



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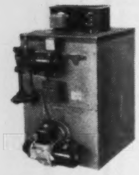
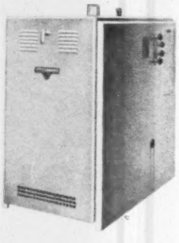
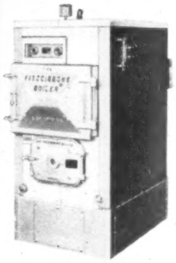
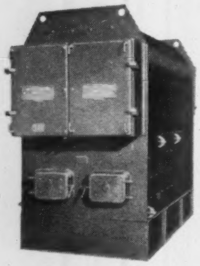
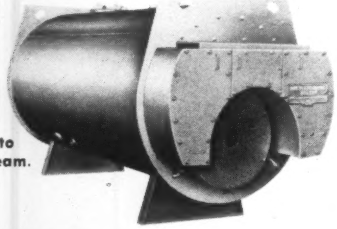
HEATING
NEEDS

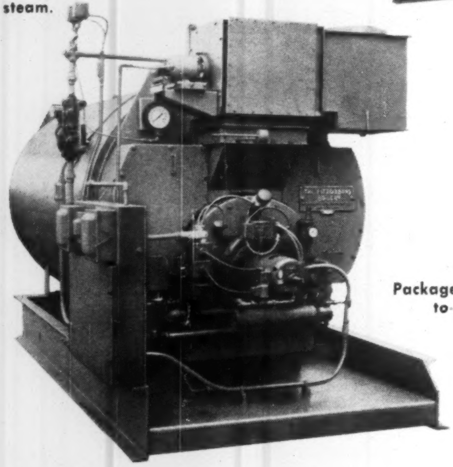

770 Series to
990 sq. ft., water, boiler-burner
and enclosed units.


400 Series to
1620 sq. ft., water.


RZU Junior® to
5000 sq. ft., steam.


"D" Type to
35,000 sq. ft., steam.


"Scotch" Type to
60,700 sq. ft., steam.


Packaged Boiler Unit
to 464 hp.

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Fitzgibbons Tanksaver® with any of these units, supplies more hot water than any other method—instantly—summer and winter—without the cost of a tank.

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MOST ECONOMICAL IN FUEL
1886
THE FITZGIBBONS BOILER

FB-108

RECENT TRADE LITERATURE

Continued

catalog. Literature contains dimensions, specifications on standard, double, radial type couplings with additional data on coupling driveshafts. *Morse Chain Co., Dept. HPAC, Ithaca, N. Y.*

▶ *FLEXIBLE SHAFT MACHINE*—New 8 page catalog 57 illustrates, describes, provides data for ¼ hp multispeed, single speed flexible shaft machines for grinding, polishing, drilling in steel, wood. Also lists line of accessories, flexible tool shafts, power drive shafts, drill shafts. *Stow Mfg. Co., Dept. HPAC, 443 State St., Binghamton, N. Y.*

▶ *FLOAT CONTROLS*—Selection, application, prices of float controls for air conditioning, refrigeration systems contained in condensed catalog 56. Literature features valve capacity table for refrigerants. Table lists both direct, remote feed float and pilot operated valve capacities. *H. A. Phillips & Co., Dept. HPAC, 3255 Carroll Ave., Chicago 24.*

▶ *FLUID SYSTEM SPECIALTIES*—Catalog 4395 covers fluid system specialties including clips for support of tube lines, dual heat transfer coil for cooling applications, pressure snubber for protection of gages, manifold valve designed to simplify draft gage line blowout. *Tube & Hose Fittings Div., Parker Appliance Co., Dept. HPAC, 17325 Euclid Ave., Cleveland 12.*

▶ *FORGED STEEL UNIONS*—Dimensional, engineering data on line of forged steel unions for high pressure service presented in 8 page bulletin U-1-56. *W-S Fittings Div., H. K. Porter Co., Inc., Dept. HPAC, Roselle, N. J.*

▶ *GLASS FIBER INSULATIONS*—Brochure No. WPD-12 details three kinds of flame-blown glass fiber insulations for thermal, acoustical applications. Charts illustrate proper-

Your Company Got the BENDS?

If you've got the bends... pipe bends, that is... stop and think a moment about this: ADSCO Expansion Joints will do a better job because of...

- ***LESS HEAT LOSS.*** A 12-inch line 1000 feet long, carrying steam at 200 lbs. and 550 F. will lose 16% more heat if bends are used instead of ADSCO Expansion Joints.
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If you are planning construction of a pipe line or modernization of an existing one with bends, ADSCO invites inquiries on the use of Corruflex Packless or Slip-type Expansion Joints.

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ADSCO INDUSTRIES, INC.
20 MILBURN ST. BUFFALO 12, N. Y.

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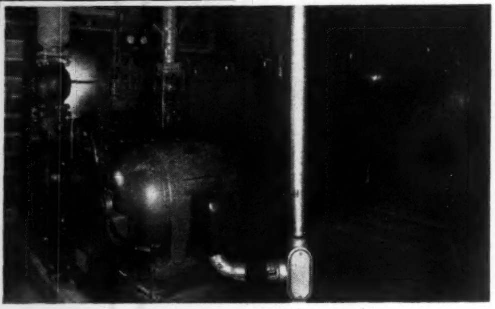

Jewish Old People's Home

KANSAS CITY, MISSOURI

. . . decides on Vilter

The attractive modern decor of this restful lounge is in keeping with today's trend towards comfortable homes for the old folks.

The Vilter 8-cylinder Freon VMC compressor used in this installation. Reliable performance has won Vilter wide acceptance in commercial air conditioning of all kinds.

Q. How can one provide that extra something for our older folks?

A. Install reliable Vilter® AIR CONDITIONING to insure maximum comfort—equipment which

costs less to own*

In this Jewish Old People's Home at Kansas City, Missouri, Vilter air conditioning plays an important role in the drama of life . . . providing modern comfort and pleasant leisure for older people during their golden years. Here, as elsewhere, Vilter prides itself in a job well-engineered, carefully installed, utilizing air conditioning equipment noted for economical operation and long life . . . important considerations in community service organizations operating homes on fixed incomes.

In this Home, Vilter equipment includes a Freon VMC compressor with a step down control to reduce refrigeration capacity by 25%, 50%, or 75% of full rated load, and which makes for greater economy of operation. Vilter VMC's are known for their smooth, dependable operation and efficient performance.

It will be good business for you to see your nearest Vilter engineer for a careful evaluation of your air conditioning and refrigeration needs for all types of offices, clubs, schools, and commercial buildings.

Sold and installed by O'Dower Engineering Company, Kansas City, Missouri

* Savings in low first cost are not the complete answer when considering the installation of refrigeration equipment. But savings in terms of years of extra service, reliable performance and minimum maintenance—that's where Vilter excels in low-cost ownership.

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QUALITY CRAFTSMANSHIP that lasts . . .

ENGINEERING DESIGN that guarantees performance

REFRIGERATION and AIR CONDITIONING

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Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water & Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice & Polarflake Ice Machines

RECENT TRADE LITERATURE

Continued

ties of "Microlite," "Super Fine" and "Microtex" insulating blankets. *L. O. F Glass Fibers Co., Dept. HPAC,* 1810 *Madison Ave., Toledo.*

▶ *GREASES*—Technical bulletin 50 announces company's new line of "Sun Prestige 40 Series" greases designed to resist water, high temperatures. *Sun Oil Co., Dept. HPAC,* 1608 *Walnut St., Philadelphia* 3.

▶ *HEAT TRANSFER OILS*—Two "Aromatic" heat transfer oils detailed in 20 page technical bulletin. Products are formulated to resist thermal cracking, provide no sludge or coke deposits, have high heat transfer rates, permit easier starting, provide lower power costs and longer service life. *Socony Mobil Oil Co., Inc., Dept. HPAC,* 26 *Broadway, New York* 4.

▶ *HEATING, VENTILATING*—Expanded line of heating, ventilating products described in 12 page catalog No. 46PQRV-72. Booklet designed to show versatility of units in application for large area buildings, schools, auditoriums, gymnasiums. *Carrier Corp., Dept. HPAC, Syracuse* 1.

▶ *HUMIDIFICATION*—*A Few Facts About Humidification for Industry* is title of 4 page bulletin No. 492. Humidifiers in company's line described, illustrated. *Abbeon Supply Co., Dept. HPAC,* 179-15 *Jamaica Ave., Jamaica* 32, *N. Y.*

▶ *LIQUID RETURN SYSTEMS*—Liquid return systems for ammonia in refrigeration cycles covered in 8 page bulletin LRS-56. Diagrams with step-by-step explanations show how basic system and variations operate. *H. A. Phillips & Co., Dept. HPAC,* 3255 *W. Carroll Ave., Chicago* 24.

▶ *LUBRICATED PLUG VALVE*—New 28 page catalog (reference

CLOSE TO THE 4 BILLION DOLLAR MARK

Torrington air-impellers are contributing to the quality and saleability of products valued at nearly $4 billion a year. A partial list of product categories:

Room air conditioners
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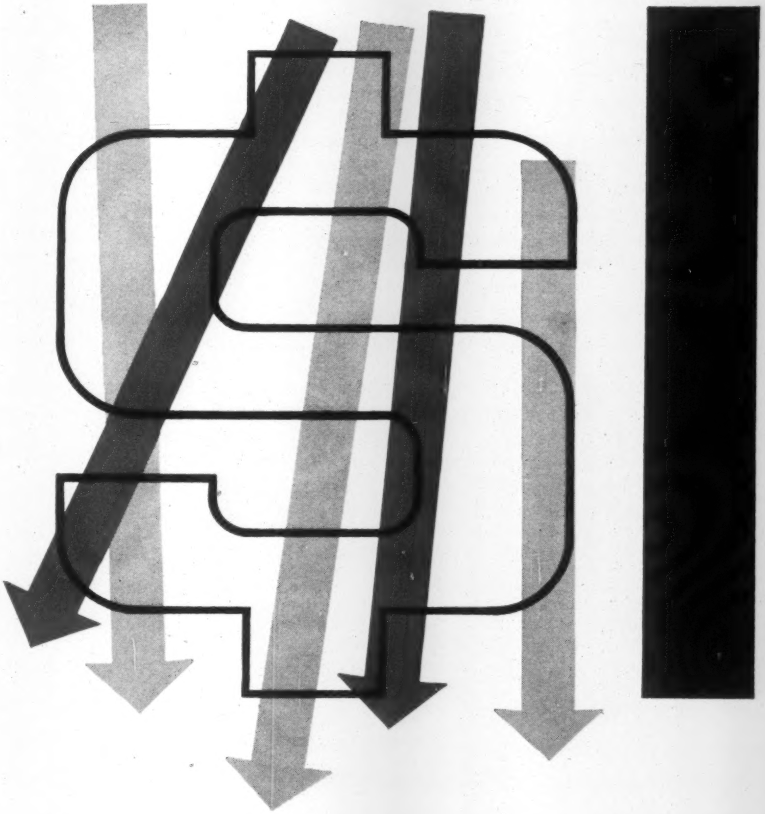
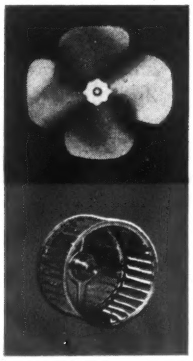
Commercial coolers
Window ventilators
Kitchen fans
Hassock fans
Electronic cooling devices
Space heaters
Oil burners
Unit heaters

If you have a design or manufacturing problem involving air-impeller equipment, Torrington's industry-wide reputation is your assurance of quality and service.





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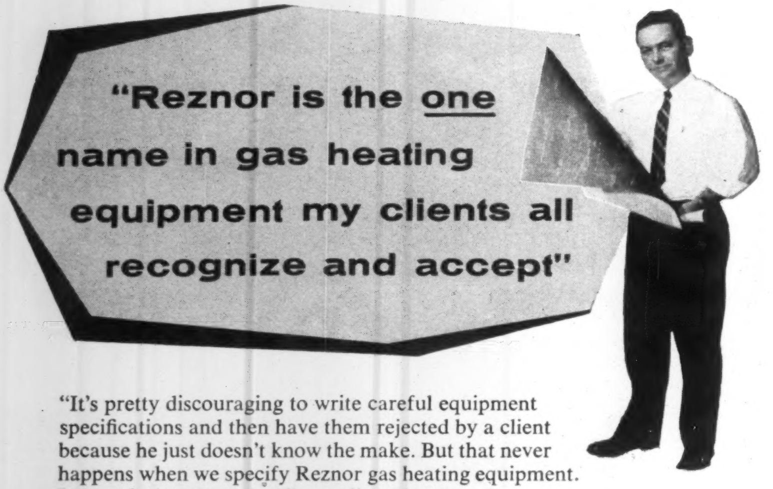

"Reznor is the one name in gas heating equipment my clients all recognize and accept"

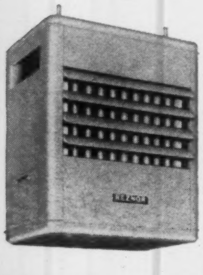
"It's pretty discouraging to write careful equipment specifications and then have them rejected by a client because he just doesn't know the make. But that never happens when we specify Reznor gas heating equipment. Reznor is the one make all our clients know and accept. It's not hard to understand why. Reznor sells nearly one out of two gas unit heaters, so Reznor is the unit heater our customers are used to seeing wherever they go. And Reznor is the brand they see advertised in the national magazines they read.

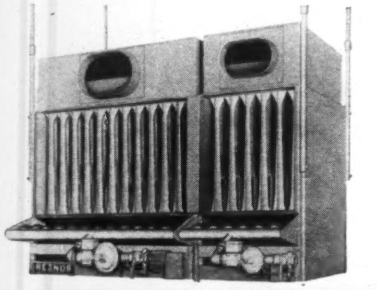
"Client acceptance is only one of the reasons we specify Reznor equipment. We know from experience that Reznor stands for quality of construction and performance. High operating efficiency . . . long life . . . dependable service.

"We like to work with Reznor because it gives us one source for all our gas heating equipment needs . . . suspended gas unit heaters for all industrial and commercial heating requirements . . . gas-fired duct furnaces which let us custom engineer heating and heating-cooling systems to meet exact job requirements.

"We appreciate Reznor availability, too. There's a stocking Reznor distributor in every major city. We know we can specify Reznor equipment with complete assurance that the units we specify will be available when and where they're needed."

Yes, Reznor is the preferred line of gas heating equipment . . . preferred by clients, by architects, engineers and heating contractors. If you don't know Reznor, it's time you got acquainted. Write today for free catalog or give your nearby Reznor distributor a call. You'll find him listed under "Heaters-Unit" in the yellow pages of your telephone directory.





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THE WORLD'S LARGEST-SELLING
GAS UNIT HEATERS
REZNOR MANUFACTURING COMPANY
51 Union Street, Mercer, Pa.

RECENT TRADE LITERATURE

Continued

book 39—section 5) details 100 percent pipe area, venturi, round port and diamond port lubricated valves in variety of metals for 150 psi steam, 200 psi oil-water-gas, and ASA 150 and 300 psi classes. *Homestead Valve Mfg. Co., Dept. HPAC, Coraopolis, Pa.*

▶ *MAGNETIC STARTERS*—Features, application, size classification, construction, base plates, contactors, main and auxiliary contacts, side mounted and base mounted auxiliaries, overload relays, terminals, types of control in company's line of across-the-line type nonreversing a-c magnetic starters covered in bulletin 4110. *Ward Leonard Electric Co., Dept. HPAC, Mount Vernon, N. Y.*

▶ *MOTOR CONTROLS*—Operational, dimensional, price data on manual and automatic motor controls contained in 132 page catalog. Enclosures available for operation in damp, hazardous dust and gas locations described, illustrated. *Allen-Bradley Co., Dept. HPAC,* 136 *W. Greenfield Ave., Milwaukee* 4.

▶ *MOTORS* — "Linc-weld" motors with "Multiguard" protection illustrated, described in 4 page brochure. "Multiguard" is designed to provide seal against chemicals, moisture, mechanical shorts, vibration, dust and dirt abrasion. Literature cites design extras, includes table of specifications. *Lincoln Electric Co., Dept. HPAC,* 22801 *St. Clair Ave., Cleveland* 17.

▶ *NOISE, VIBRATION DAMPERS* —Bulletin K2D describes vibration, noise absorbing machinery mounts utilizing "Elasto-Rib" isolation medium. Construction, installation diagrams and dimension, loading capacity tables included. *Korfund Co., Inc., Dept. HPAC,* 48-*OIF* 32*nd Pl., Long Island City, N. Y.*

▶ *NOZZLES*—New edition of *Nozzle Guide* is designed to provide ac-

WHEATLAND-57

wherever you look . . . there's PIPE in the picture!

Steel pipe is the "Work Horse" of modern industry. Specify Wheatland Steel Pipes, black or galvanized. Make certain your picture comes out just right with dependable service, consistency of strength, and constant uniformity.

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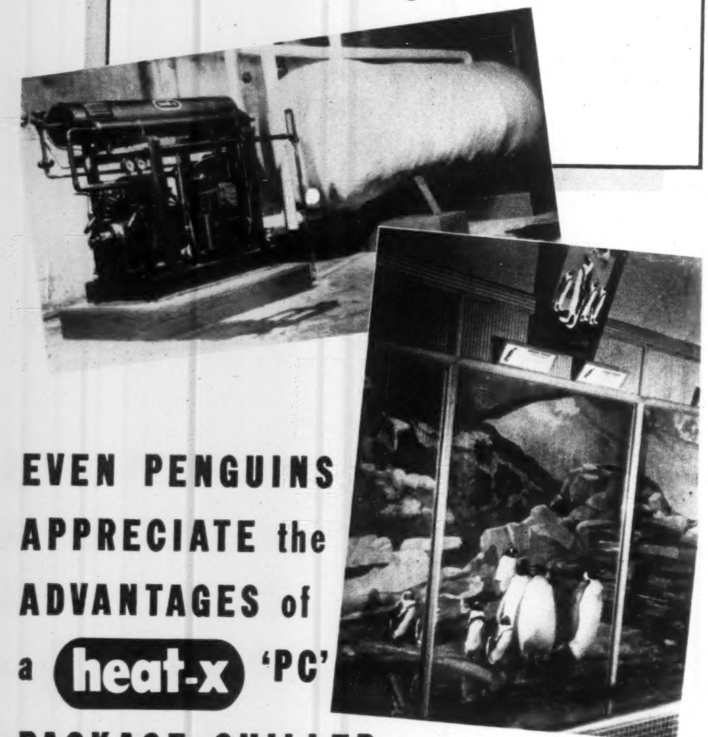

CASE HISTORY

Another Space-Saving Application of
Heat-X 'PC' Package Chillers.
National Zoological Park
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EVEN PENGUINS APPRECIATE the ADVANTAGES of a heat-x 'PC' PACKAGE CHILLER

Only with a Heat-X 'PC' Package Chiller could the desired capacity be obtained while allowing sufficient space for the required 400 gal. storage tank.

Here, chilled water maintains the penguin pool at 35° F . . . is also used to hose down cage floor and maintain cage temperatures at approximately 40° F.

Patented Inner-Fin® design of 'PC' Package Chillers makes possible this maximum capacity with minimum bulk. All-copper construction of water passages eliminates any corrosion problem . . . assures continued satisfactory operation.

Write for complete information on Heat-X 'PC' Package Chillers in 2 HP through 100 HP models.

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RECENT TRADE LITERATURE

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curate, detailed information as to type of nozzle to be used on various oil burners. Information, supplied by almost 200 companies, given relating to type, nozzle angle recommended for almost every model of boiler burner and furnace unit. $1.00 per copy. *Wm. Steinen Mfg. Co., Dept. HPAC,* 43 *Bruen St., Newark, N. J.*

▶ *OIL BURNER* — Industrial oil burner said to effect 30 percent savings in fuel costs by using No. 5 oil described in 4 page bulletin. Detailed specifications included. "Econol" unit available in 60, 84 hp sizes. *York-Shipley, Inc., Dept. HPAC,* 500 *Jessop St., York, Pa.*

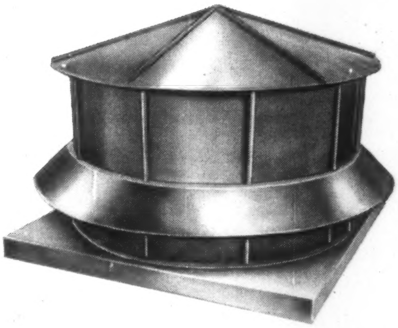
▶ *PIPING ENGINEERING*—Booklet 4.04 of a series contains fundamentals of determining expansion, flexibility of piping systems. Sample problems, theory discussed in 20 pages. *Tube Turns, Dept. HPAC, Louisville* 1,

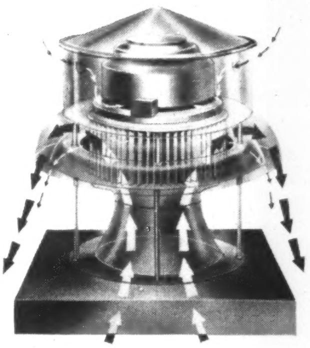
▶ *PLASTIC PIPE*—"Ace Riviclor" chemical resistant plastic pipe, fittings, valves described in 8 page bulletin CE-56. Includes technical properties, table of resistance to chemicals, data on sizes, pressure, and dimensions, and prices for pipe, fittings, and valves ½ to 2 in. *American Hard Rubber Co., Dept. HPAC,* 93 *Worth St., New York* 13,

▶ *PNEUMATIC, ELECTRIC TRANSMITTERS*—Bulletin No. 170 describes design features of new transmitters for company's rotameters. Contains detailed application, operational data supplemented by schematic drawings. *Brooks Rotameter Co., Dept. HPAC, Lansdale, Pa.*

▶ *PREFORMED DUCT LINER*—Preformed duct liner for acoustical, thermal insulation featured in 4 page brochure. Contains illustrations, tables of sound absorption coefficients and thermal conductivity. *Insul-Cous-*

Only Gallaher Air-Vans® Give You These 12 Vital Features





- ✓ Inconspicous Appearance
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- ✓ Quiet Operating
- ✓ Certified Ratings
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- ✓ Standard Motors
- ✓ Weatherproof

These are the twelve vital features that engineers check when specifying power roof exhausters. They are the secret to many years of service and highly efficient performance. Each feature adds to the economy and efficiency of the unit. The owner will save money over the years. The architect and engineer achieve the ultimate in function and appearance.

If you're not yet acquainted with Air-Vans, it'll pay you to investigate them on your next building job.

Write for complete information, or contact your Gallaher representative.

The GALLAHER Company

4108 Dodge St. Omaha, Nebraska

Pioneers in Research Design Power Roof Exhausters

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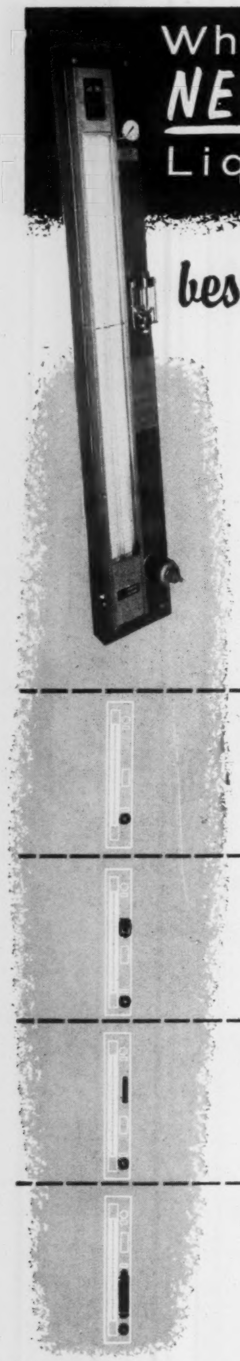

Which of these *NEW* PETROMETER Liquid Depth Gauges

best suits your installation?

You can obtain new Petrometer Series 1400 Remote Reading Tank Gauges in 4 Models to suit almost every industrial installation. All gauges operate on the sound principle of hydrostatic pressure . . . no moving parts or intricate mechanisms to cause failure through wear, corrosion or friction. Large, vertical scale gives accurate, easy-to-see readings.

Gauges can be installed on tanks above or below the ground and up to ¼ of a mile away.

CHOOSE FROM THESE 4 MODELS

MODEL 1400 A

Equipped with aerating valve for semi-automatic purging of the transmission line. Purging line attaches to compressed air line.

MODEL 1400 B

Equipped with Bubbler as well as aerating valve. Transparent Bubbler provides a constant visual check on aeration. Used with compressed air source.

MODEL 1400 F

Equipped with Flowmeter and aerating valve. Actual rate of flow of air for purging can be preset and indicated on the Flowmeter. Requires compressed air supply.

MODEL 1400 M

For use where compressed air source is unavailable. Equipped with Manual Air Compressor and Aerating Valve.

Petrometer Gauges can be obtained in multiple units incorporated on a single panel and mounting plate to meet your specifications. High-level — low-level alarms also available.

For complete information, send for Bulletin 6004.

Petrometer

Petrometer CORPORATION

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RECENT TRADE LITERATURE

Continued

tic Corp., Dept. HPAC, 42-23 54*th Rd., Maspeth* 78, *N. Y.*

▶ *PRESS WELDER*—Bulletin 3-413 describes heavy duty press welders said to be capable of pressures to 9000 lb weld force in short throat models. *Taylor-Winfield Corp., Dept. HPAC, Warren, Ohio.*

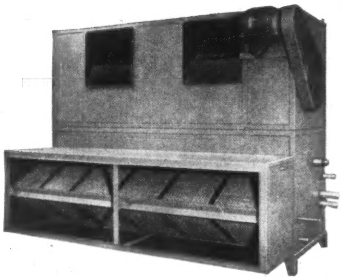
▶ *PRESSURE SENSITIVE TAPES*—Handbook describes uses for company's pressure sensitive tapes. Literature designed to aid production engineers, designers. *Mystik Adhesive Products, Inc., Dept. HPAC,* 2635 *N. Kildare Ave., Chicago* 39.

▶ *SAWS*—Line of cut-machining units — including various types of abrasive cutoff saws, portable combination cutoff and deburring chop saw, large modular cutoff saw, swing type cutoff saw, rotating cutoff saw — described in 44 page booklet. *Wallace Supplies Mfg. Co., Dept. HPAC,* 1300 *Diversey Pkwy., Chicago* 14.

▶ *SCHOOLROOM HEATING, VENTILATING SYSTEM*—Technical folder contains description of company's individual classroom package which includes furnace and enclosure unit with electrically controlled damper assembly for mixing outdoor air and room air to maintain proper ventilation, and "Util-i-Duct" bookshelf sections which provide forced air distribution. *Norman Products Co., Dept. HPAC,* 1150 *Chesapeake Ave., Columbus* 12.

▶ *SCREW MACHINE PRODUCTS*—Four page brochure depicts typical screw machine work in variety of tough alloys including stainless steels, Inconel, nickel, titanium. Fabrication operations, techniques required for each of eight illustrated items described as well as dimensions, tolerances. *Allmetal Screw Products Co., Inc., Dept. HPAC,* 821 *Stewart Ave., Garden City, L. I., N. Y.*

KENNARD ENGINEERED PRODUCTS



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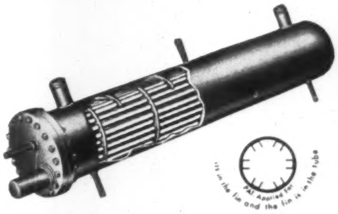
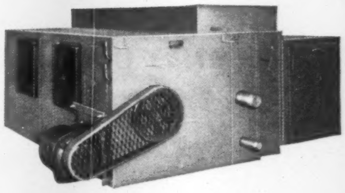
13 Sizes. 300 to 21,600 CFM. Horizontal or Vertical



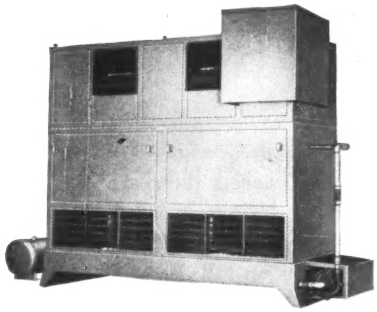
LIQUID CHILLERS

Direct Expansion Type.
Sizes 2 to 200 tons.



HEATING & VENTILATING UNITS

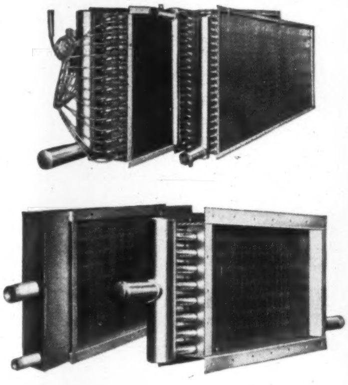
Air Volumes 300 to 28,800 CFM.



EVAPORATIVE CONDENSERS

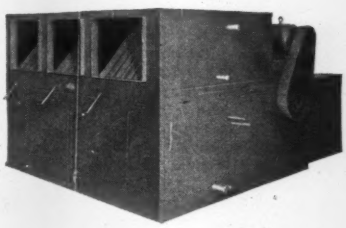
Outdoor-Indoor

Model ERC. 15 to 75 tons.
Model EK. 3, 5, 7½, 10 & 15 tons.



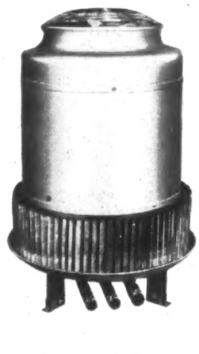
FINNED COILS

Cooling or Heating. Sizes from 4 to 24 tubes wide and up to 120 inches Finned Length.



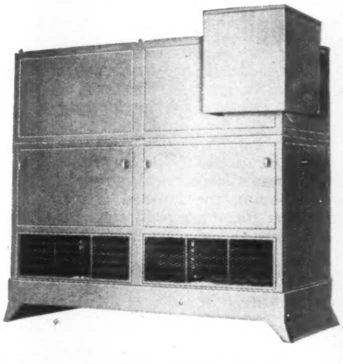
MULTI-ZONE UNITS

6 Sizes. Cooling Coil Face Areas up to 36 sq. ft.



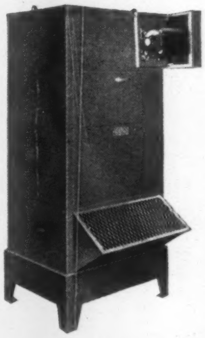
WATER SAVER

Fiberglas reinforced plastic cabinet and sump. Model QT. 3 and 5 ton sizes.



COOLING TOWERS

Outdoor-Indoor.
Model CT. 15 to 75 tons.

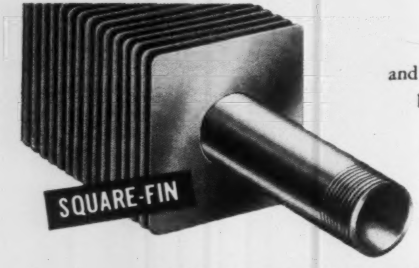


COOLING TOWERS

Outdoor-Indoor in stock. Model KT. 5 sizes, 3 to 16 tons.

KENNARD CORP.
1817 S. HANLEY ROAD
ST. LOUIS 17, MO.

Air Conditioning Equipment



All *Slant-Fin* products — heating elements and enclosures — are advance-engineered and built to exacting specifications. Regardless of the application, *Slant-Fin* can meet your requirements either with a standard item from an extensive line or fabricate an assembly for your special needs.

WHEN YOU NEED FINNED-TUBE FOR HEATING...REMEMBER THESE

5 reasons

WHY YOU SHOULD ALWAYS SPECIFY

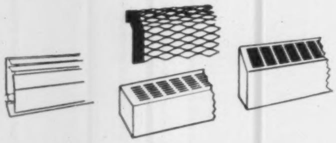
SLANT-FIN

1. Highest heat output

You have a choice of heating elements — the traditional Square-Fin Series or the distinctive Slant-Fin Series with many exclusive advantages. With greater surface per fin and interlocking fin-and-flange construction, these elements supply a high heat output per linear foot. A variety of fin spacings and tube sizes from ¾" to 2" provide a complete range of approved ratings.

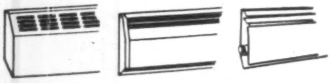
2. The most complete line for commercial heating

For office buildings, factories, churches, schools, hospitals and other large area heating installations, *Slant-Fin* radiators and enclosures are unsurpassed. Heating elements in 1¼" and 2" all-steel, all-copper or copper-aluminum provide maximum heating efficiency with economical material and labor costs. A wide range of enclosures from the practical expanded metal to the ultra-modern "low line" permits complete flexibility for individual requirements.



3. Residential baseboard, too

For private offices, hotel rooms, motels, or any small space where both heating efficiency and appearance are desired, *Slant-Fin's* complete line of residential baseboard is ideal. Again, you have a wide choice. Four different heating elements of ¾", 1" and 1¼" are available in all-steel or copper-aluminum. Three different enclosure styles, too.



4. Labor and material savings

Slant-Fin products are made to be installed in the shortest possible time. For example, snap-on enclosures eliminate the need for screws, tools or special mountings. And both heating elements and enclosures are supplied in pre-cut lengths, tailored to your job.

5. Special applications

For special industrial and commercial process applications, either heating or cooling, *Slant-Fin* has the engineering experience and exclusive production techniques to fabricate finned-tube to the user's particular needs. Whether made of stainless or galvanized steel, wrought iron or aluminum, the finished assemblies will meet the most rigid tests for quality construction and efficiency.

You owe it to your reputation to include Slant-Fin in your plans. Catalog 1000 describes Slant-Fin's commercial and residential line. Write today for your copy.

BOOTH 439—International Heating & Air Conditioning Exposition, Chicago, Feb. 25-Mar. 1.

SLANT-FIN RADIATOR CORPORATION

87-49H 130th Street • Richmond Hill 18, New York

RECENT TRADE LITERATURE

Continued

▶ *SELF WICKING LUBRICANT*—Eight page brochure discusses "Permawick" self sealing, liquid lubricant. Product is formulated to make possible complete high speed "wicking" and "oiling" in single operation on pumps, fans, blowers, motors. *Fluidwick Co., Dept. HPAC, 5319 E. Outer Drive., Detroit 34.*

▶ *SOLDERING*—Bulletin No. A-100 contains photographic, step-by-step instructions for soldering aluminum welding cable to copper terminals and copper arc welding accessories. Proper solders and fluxes recommended, as well as instructions for soldering aluminum to aluminum and copper to copper. *Tweco Products, Inc., Dept. HPAC, P. O. Box 666, Wichita 1, Kan.*

▶ *STAINLESS STEEL FASTENERS* Eight page condensed stock list of stainless steel fasteners illustrates 37 basic fastening devices. Included are screws, bolts, nuts, washers, rivets, pins, etc. *Allmetal Screw Products Co., Inc., Dept. HPAC, 821 Stewart Ave., Garden City, L. I., N. Y.*

▶ *STEAM HEATING*—New 8 page bulletin No. 1501A illustrates line of steam heating specialties. Products include radiator valves, float and thermostatic radiator traps, inverted bucket traps, strainers, air eliminator air checks, and gages for steam, oil, gas, water. Specification data covers dimensions, weights, sizes, capacities. *Dunham-Bush, Inc., Dept. HPAC, West Hartford, Conn.*

▶ *STEAM TRAP*—Mailing piece describes new steam trap which uses kinetic energy of steam to close trap, tells how it works. *Sarco Co., Inc., Dept. HPAC, Empire State Bldg., New York 1.*

▶ *STEEL PIPE, TUBING, WELDING FITTINGS*—Condensed data on mechanical properties, creep

QUIET-TESTED EXHAUSTERS

"Given the Works"

BY

JENN-AIR

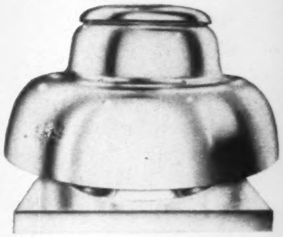
SOUND-ELEC TEST CHAMBER!

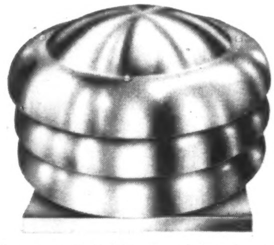
Only Jenn-Air Quiet-Tested Exhausters are pre-proved under simulated field conditions. Before leaving the factory, each unit must pass rigid inspection by the critical "Vibronic Eye" . . . each is line-lab tested by Jenn-Air's Sound-Elec Test Chamber to detect noise, vibration, and structural weakness. Only units which pass this inspection are accepted for shipment.

SOUND-ELEC TEST
CHAMBER

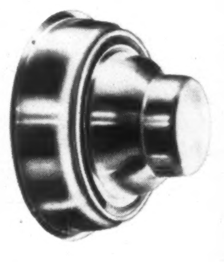
Exclusive U-Spring Suspension of Jenn-Air's *Direct Drive Power Roof Exhauster* virtually eliminates noise caused by vibration. U-Springs suspend the power assembly, isolate it from the base. Motor and blade are balanced together, as a further safeguard against vibration and noise. Heavy gauge all-aluminum housing—non-overloading all-aluminum wheel—assure trouble-free performance. Ball bearing motor is lubricated for 10 years of continuous service.

In this Quiet-Tested *Belt Drive Power Roof Exhauster*, positive weather-proof engineering is combined with trim Low-contour design. Full ball bearing drive and motor are mounted out of the air stream. Heavy gauge all-aluminum construction gives strength without weight. Exhauster can be quickly, easily disassembled for re-assembly on the roof. All standard models come with a disconnect switch as an integral part of the Unit. Non-overloading blade, dynamically and statically balanced, also ensures long life—smooth, quiet operation.

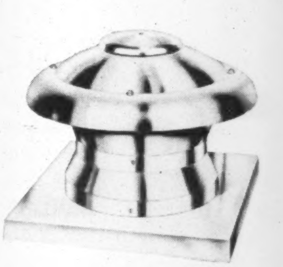




Jenn-Air *Relief Vent and Air Intake*, designed for use where positive pressure is present within the building. Constructed of heavy gauge aluminum. Relief Vent eliminates unsightly gooseneck or hood normally used for air outlet or intake. Outlet area is 100% greater than throat area, thus limiting pressure-loss through Unit to a minimum. Spring loaded or motorized back draft dampers available when specified.



Centrifugal Wall Exhauster. Eliminates most duct work. Provides a means of ventilation through the wall when roof exhausters would prove unsuitable or more costly, as in multi-story buildings. Completely weather-proof all-aluminum . . . unusually quiet . . . same non-overloading characteristics as in all other Jenn-Air Units.



Axial-Type Roof Exhauster. Recommended for general ventilation work and duct-type applications where static pressures do not exceed one-half inch. Outstanding features: Special non-overloading design . . . quiet-running pressure-type aluminum blades . . . high-quality all-aluminum construction.

JENN-AIR PRODUCTS COMPANY, INC.

1102 Stadium Drive Indianapolis 7, Indiana

Warehouse stocks in all major cities

Exhausters for Public, Commercial and Industrial Buildings

There's just
no test
like time!

M&L FUEL OIL HEATERS
Manning & Lewis

• And no time like now, to look into the complete line of Manning and Lewis Fuel Oil Heaters for any heavy fuel oil burning installation.

Whether you're heating fuel oil with hot water or steam, for power plants or commercial buildings, storage tanks or bulk distribution stations, M & L has the heater to which "time" is only a word . . . not another meaning for disintegration.

These claims are not a fantasy. They are based on years of acceptance and preference in thousands of installations in every state of the union.

M & L Fuel Oil Heaters comply with the highest standards of the Fuel Oil and Water Heater Manufacturers Association and are guaranteed to be free from defects in workmanship and materials.

Send for your copy of Bulletin 743 . . . a detailed story with technical data included, on the complete line of M & L Fuel Oil Heaters.

Manning & Lewis
Engineering Co.
M&L
32 Ogden Street Newark 4, New Jersey
SALES REPRESENTATIVES IN PRINCIPAL CITIES

RECENT TRADE LITERATURE

Continued

strength, physical properties, hot and cold bending, welding, heat treatment, working pressure for "Croloy" steel pipe, tubing and welding fittings presented in 4 page technical data card 152-A. *Babcock & Wilcox Co., Tubular Products Div., Dept. HPAC, Beaver Falls, Pa.*

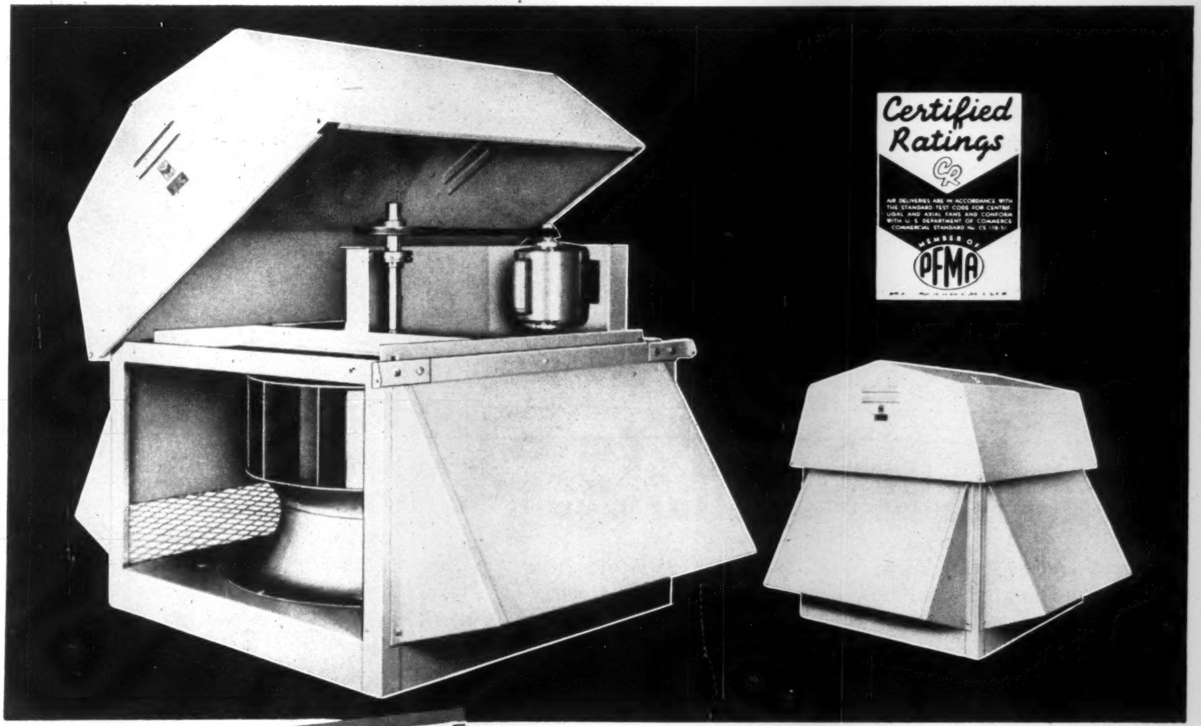
▶ *STUD WELDING*—Industry standards for arc welding studs, pins and tapped pads for stud welding presented in 36 page booklet. Literature contains index, reference to equipment and accessories used in stud welding applications. *K S M Products, Inc., Dept. HPAC, Merchantville 8, N. J.*

▶ *TEMPERATURE CONTROLLERS*—Specifications on new series of bulb-and-capillary indicating temperature controllers presented in 4 page brochure MC-139. Literature describes how user can tailor controller to his specific operating requirements by selecting from proper "building blocks." *Fenwal, Inc., Dept. HPAC, Ashland, Mass.*

▶ *THERMOCOUPLES*—Newly designed miniature shielded thermocouples covered in bulletin. Units recommended by company for wide application in temperature measurement of gases, vapor mixtures of gases and liquids. Chart permits selection of unit for specifications needed. *Thermo Electric Co., Dept. HPAC, Saddle Brook, N. J.*

▶ *TIME DELAY RELAYS*—Bulletin sheet AWH TD403 describing time delay relays supersedes pages 1 and 2 of current catalog. Contains details on function of three basic units, along with catalog part numbers for standard ranges, voltages in a-c, d-c and 400 cycle. *A. W. Haydon Co., Dept. HPAC, Waterbury, Conn.*

▶ *TUBE FABRICATING*—Tube fabricating equipment catalog No.


Certified Ratings
CR
AIR DELIVERIES ARE IN ACCORDANCE WITH THE STANDARD TEST CODE FOR CENTRIFUGAL AND AXIAL FANS AND CONFORM WITH U S DEPARTMENT OF COMMERCE COMMERCIAL STANDARD No. CS 178-51
MEMBER OF
PFMA

PFMA CERTIFIED RATINGS

NEW Peerless Electric®

Centrifugal Roof Ventilator...

DEVELOPED AND MANUFACTURED WITH APPLIED CENTRIFUGAL BLOWER PRINCIPLES

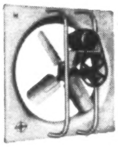
QUIET! . . . Matching wheel cone accurately fits venturi inlet to create quieter, smoother air movement. Excellent for churches, auditoriums, hospitals, and schools.

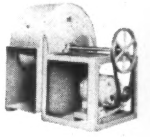
ADAPTABILITY! . . . Fits standard curb sizes. Lower horsepower ratings for quieter operation. Higher horsepower for commercial and industrial applications.

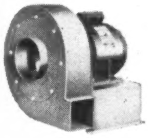
PERFORMANCE! . . . Each unit air-tested, and rated to assure certified ratings. Construction gives exceedingly high efficiencies. Detailed performance data completely covered in Bulletin SDA-220.

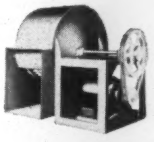
STURDY! . . . All welded construction. All material is 16 ga. or over. Built for the life of the building.

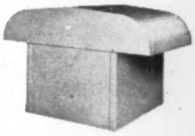
A COMPLETE LINE OF AIR MOVING EQUIPMENT









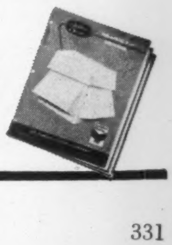


Charter Member of the Air Moving and Conditioning Association, Inc.

Peerless® Electric

FAN AND BLOWER DIVISION
THE Peerless Electric® COMPANY
1409 W. MARKET ST. • WARREN, OHIO
FANS • BLOWERS • ELECTRIC MOTORS • ELECTRONIC EQUIPMENT

Write today for Bulletin SDA-220 on Peerless Centrifugal Roof Ventilators



GOULDS PUMPS, INC., Seneca Falls, New York

Check bulletins you'd like to receive:

☐ Pump Fundamentals. A brief outline of the characteristics, operation and criteria for selecting reciprocating, rotary, and centrifugal pumps.

☐ 710.1 "Close-cupld" Centrifugal Pumps.

☐ 721.6 Single-stage Double-suction Pumps.

☐ 725.4 Centrifugal Chemical Pumps.

☐ 726.1 Vertical Centrifugal Pumps.

Name__________Title__________

Company__________

Address__________

City__________Zone_____State_____

How to buy a better pump

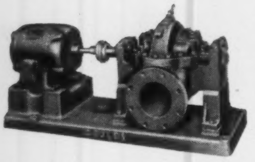
When you have to choose from dozens of pumps of different types and brands, it's hard to tell which will work best for you at the least cost.

However, when you know what to look for and how to look, you can match a pump to your needs almost exactly.

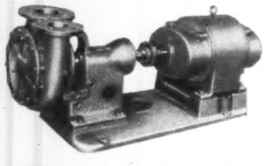
Just five of hundreds of bulletins we've prepared to help you buy wisely and well are offered above. Send for them and use them when you need a general purpose pump.

When you have a particular application in mind, write us the essentials. We'll be glad to advise you on the pump or pumps that will work best for your purpose.

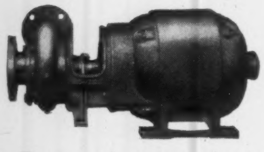
4 general purpose pumps



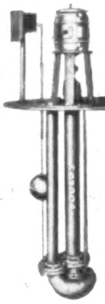
1. For large capacity pumping, the Goulds Fig. 3405. 33 sizes with capacities up to 6400 GPM; heads to 425 ft. Send for Bulletin 721.6.



2. For economical handling of hot, corrosive or abrasive liquids, the Goulds Fig. 3715 stainless steel pump. 9 sizes with capacities up to 720 GPM; heads to 200 ft. Send for Bulletin 725.4.



3. For use where space is at a premium, the Goulds Fig. 3655 "close-cupld" pump. 20 sizes with capacities up to 2000 GPM; heads to 400 ft. Send for Bulletin 710.1.



4. A submerged-type sump pump for depths of 3 to 20 ft., the Goulds Fig. 3047. 4 sizes with capacities from 10 to 650 GPM; heads up to 65 ft. Send for Bulletin 726.1.

MEMBER

Goulds PUMPS INC. Seneca Falls New York

SALES OFFICES: Atlanta • Boston • Chicago • Houston • New York • Philadelphia • Pittsburgh • Tulsa

RECENT TRADE LITERATURE

Continued

1140 covers tube cutters, flarers, benders in hand tool and bench-mounted models. Includes section on how to use tools. *Tube & Hose Fittings Div., Parker Appliance Co., Dept. HPAC,* 17325 *Euclid Ave., Cleveland* 12.

▶ *TUBING*—Data memorandum No. 1 lists 121 metals, alloys from which firm produces its standard and special small diameter tubing. Analyses grouped into carbon, alloy and stainless steels, nickel and nickel alloys, copper and copper base alloys, glass sealing alloys, reactive metals, nickel cathode materials. *Superior Tube Co., Dept. HPAC, Germantown Ave., Norristown, Pa.*

▶ *UNIT AND BLAST HEATERS*—New 4 section catalog describes "Grid" cast iron steam heat transfer surface unit heaters (both horizontal and down blow), blast heaters, radiators. Describes, illustrates one-piece construction high test cast iron heating sections together with air distribution charts, heating capacities, conversion tables. *D. J. Murray Mfg. Co., Dept. HPAC, Wausau, Wis.*

▶ *V-BELT DRIVES*—New 66 page engineering manual divided into three parts covering v-belt drive selection tables, drive design, general information, *Maurey Mfg. Co., Dept. HPAC,* 2915 *S. Wabash Ave., Chicago* 16.

▶ *VALVES*—Line of pressure, temperature, level control valves covered in 8 page catalog 56 C. Literature contains illustration, description of each unit. *Atlas Valve Co., Dept. HPAC,* 280 *South St., Newark* 5, *N. J.*

▶ *VENTILATING, EXHAUST SYSTEMS*—New 12 page literature covers thermoplastic corrosionproof centrifugal fans, ducting and fittings, hoods. Section is devoted to discus-

B.F.Goodrich

Spongex® molded Cell-Tite® Tubing for moisture-proof insulation

Spongex Molded Cell-Tite tubing is made of tough, flexible rubber with uniform non-connecting cell structure. Especially efficient and convenient for pipe insulation, it will not absorb moisture nor support combustion. Insulation value is excellent.

EASY APPLICATION Wherever used, Spongex Molded Cell-Tite may be easily secured with air-drying adhesive. Short lengths of tubing may be slipped on; longer ones may be slit lengthwise, snapped over pipe and adhesive applied to cut edges. These edges will not absorb moisture.

LOW WATER ABSORPTION Spongex Molded Cell-Tite rates as excellent, meeting ASTM specifications. Weight gain is under 10% after 24 hours immersion in water; under 5% after 3 minutes in water under 25 in. of mercury vacuum, plus 3 minutes additional atmospheric pressure.

EFFICIENT INSULATION Thermal conductivity of Spongex Molded Cell-Tite is .28 at 75° F. with no deterioration in service.

LOW SHRINKAGE AND AGING Spongex Molded Cell-Tite has no appreciable change after 7 days at 200° F. Resistance to weather-aging is good. Linear shrinkage, when aged 4 weeks at 158° F. is under 10%, most shrinkage occurring in the first week.

WIDE RANGE OF DENSITY AND FIRMNESS Standard grades of Spongex Molded Cell-Tite are ASTM 12 or 13 (from 5-13 psi to compress a one square inch disc to 75% of its height). Can be made in practically any firmness. Density varies, depending upon size and firmness, averaging ten pounds per cubic foot for soft, 15-20 pounds / cu. ft. for medium, and 20-30 pounds / cu. ft. for firm.

MANY SIZES Spongex Molded Cell-Tite tubing is made with standard outside diameters of ¾", 1", 1¼", 1½", and can be made 1⅝", 1¾", and 2". Almost any inside diameter is available up to ¼" of the outside diameter. Lengths up to fifty feet facilitate ease and simplicity of installation.

VARIETY OF COLORS Black is standard and can be furnished as non-staining to lacquer, enamel or plastic. (Tested for 24 hrs. under ultra-violet light or for 10 days at 158° F.). Any one color available for requirements of 7,500 ft. or more. White, if specified, would be off-white.

For more information write B. F. Goodrich Sponge Products, a division of The B. F. Goodrich Company, 381 Derby Place, Shelton, Conn.

B.F.Goodrich

SPONGE PRODUCTS

Paracoil THERMO-FILM*
Safety Fuel Oil Heater

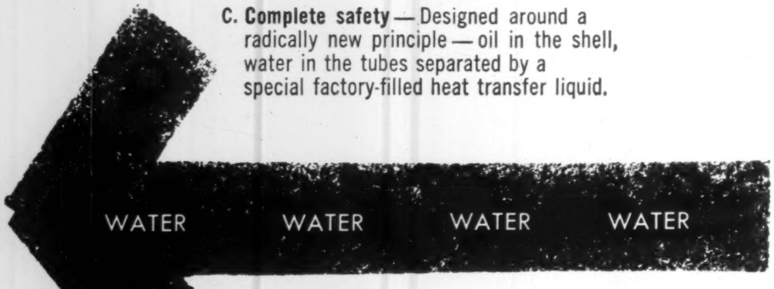
OIL
OIL
OIL
OIL

Delivers hot fuel oil at lowest cost!

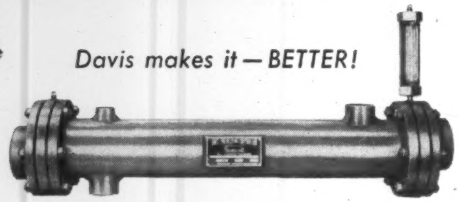
a. **High oil exit temperatures**—Full rated capacity because of 100% true counter-flow straight tube construction. And, extended tube surface greatly increases heat transfer capacity.

b. **Cheaper installation**—No electric wiring. No warning systems to install. Lightweight, compact unit requires no special supports.

c. **Complete safety**—Designed around a radically new principle—oil in the shell, water in the tubes separated by a special factory-filled heat transfer liquid.



Davis makes it—BETTER!



LOWER FIRST COST...LOWER INSTALLED COST

Approved by Board of Standards and Appeals, City of New York. Cal. No. 321-55SA

Write for Bulletin 60 N.

DAVIS ENGINEERING CORPORATION
30 Rockefeller Plaza, New York 20, New York Circle 6-5650
1064 East Grand Street, Elizabeth 4, New Jersey ELizabeth 2-6780

*Trademark/Patent Pending

RECENT TRADE LITERATURE

Continued

sion of polyethylene nonplasticized polyvinyl chloride centrifugal fans. *American Agile Corp., Dept. HPAC, P. O. Box 168, Bedford, Ohio.*

➤ *VERTICAL PRESSURE FILTERS*—Publications 6319 and 6320 provide details on company's vertical pressure filters with filter control for use in industrial plants, hospitals, schools, other types of institutional, commercial applications. Literature covers types "A" and "B" filters, respectively—the difference being primarily in underdrain system of each. *Cochrane Corp., Dept. HPAC, 17th St. below Allegheny Ave., Philadelphia 32.*

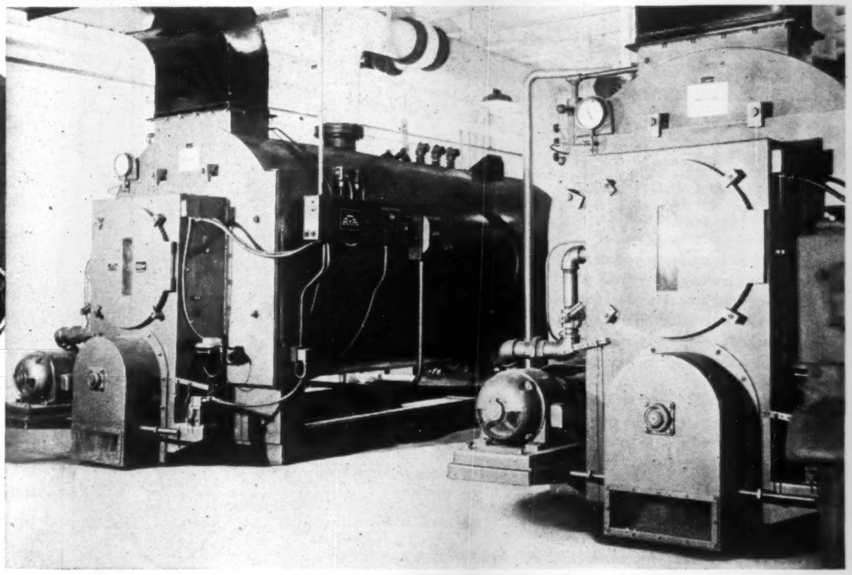
➤ *WELDING*—*Power Supplies for Gas Shielded Metal Arc Welding* is title of 12 page reprint. Paper provides information on use of constant voltage transformer-rectifier with automatic regulations for fluctuations in line voltage. *Air Reduction Sales Co., Div. of Air Reduction Co., Inc., Dept. HPAC, 150 E. 42nd St., New York 17.*

➤ *WELDING*—*Eutectic Welding Institute* manual, 56 pages, revised to include latest of company's low temperature welding alloys. Publication is in seven sections devoted to improved welding of steels, stainless steels, nickel and nickel alloys, cast iron, aluminum, copper and copper alloys, difficult-to-weld base metals. *Eutectic Welding Alloys Corp., Dept. HPAC, 40-40 172nd St., Flushing 58, N. Y.*

➤ *WELDING*—*Arc Weld Aluminum as Easily as Mild Steel* is title of new folder describing "Low Amp Eutec-Trode 2101 DC" electrode for aluminum. Cited feature of product is extruded coating. *Eutectic Welding Alloys Corp., Dept. HPAC, 40-40 172nd St., Flushing 58, N. Y.*

➤ *WELDING*—Welding shop wall chart (TIS 2612) lists torch, arc

"No engineer likes a gamble. That's why I want the UNFAILING DEPENDABILITY of Packaged Boilers"



Two 175-HP Gas-Fired Continental Automatic Boilers, installed at Tri-County Joint School District, Canton, Pa.

"As an engineer, I can't afford to take a chance. So when we design a modern heating plant, I make certain we get dependability. In fact, that's why I insist on Packaged Boilers.

"Heating, power and process requirements are always of vital importance. That's why two Packaged Boilers, each designed to carry 75% of the maximum demand, may very well be a better buy than one built-up firebox type of boiler. Sure, that's conservative designing. But it pays off in winter-long reliability, no matter what the weather.

"Later, if new buildings are added or there's some other need for increased steam production, it's easy and economical to install another Packaged Boiler. So we not only get dependability, but flexibility, too. That kind of a package makes everybody happy."

Six Reasons Why it Pays to Buy a CONTINENTAL Automatic Boiler

* Guaranteed 80% efficiency . . . Fire-tested before shipment . . . Range, 20 to 500 hp.

* Simple, practical two-pass design, for uniform flow of combustion gases through all return tubes.

* Maximum radiant heat transfer achieved by "Spinning Gas" technique for thorough mixing of air and atomized fuel.

* High-CO_2 and low-temperature stack gases — proof of high combustion efficiency.

* Free, rapid water circulation improves heat transfer, keeps heating surfaces clean.

* Easy access to furnace and all return tubes. Refractory baffles and brickwork are not required.

For details on the Continental Automatic Boiler, send for Bulletin BE-3

BOILER ENGINEERING & SUPPLY COMPANY, INC.

8 Manavon Street, Phoenixville, Pa.

A HALF CENTURY OF BOILER MANUFACTURING EXPERIENCE

The Continental AUTOMATIC BOILER

Building or Expanding?

THINK of
SAFETY
CONVENIENCE
ECONOMY
THINK of

Babbitt

Adjustable
SPROCKET RIM
with Chain Guide

- Simplifies pipe layout
- Fits any size valve wheel
- Easy to install and operate
- Operates any valve from plant floor
- Time and money saving fixture
- No maintenance, first cost only cost
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- Hot galvanized, rust-proof chain available for all sizes
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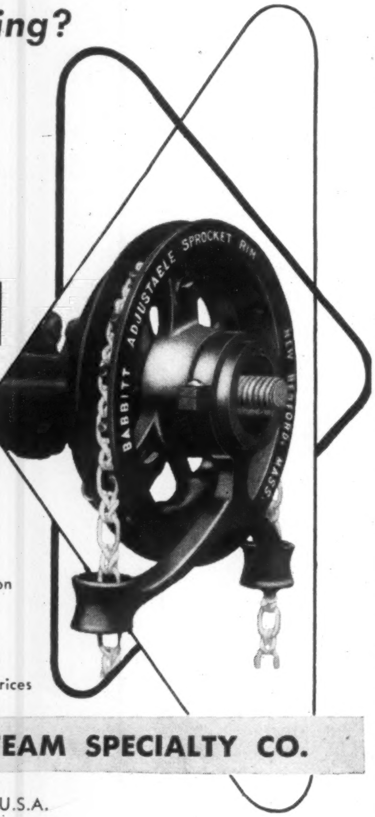
- Your supplier carries complete stocks
- Write for new descriptive catalog sheet and prices



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Spiral wire reinforced
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Flexaust hoses and Portovent ducts are made with strong cotton or nylon fabrics, impregnated and coated with neoprene compounds. Seams are fully bonded. Other important features are—

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Sizes 1¼" to 36" ID Close pitch type

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Bulletin #41 — Accessories and Installation Data
Bulletin #42 — Technical data on products and service.
Bulletin #43 — Application data and type selector guide.
Bulletin #44 — Friction loss data.
Prices lists.

THE FLEXAUST COMPANY, Dept. HP-1
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RECENT TRADE LITERATURE

Continued

welding applications for cast iron, copper and copper alloys, stainless steels, nickel and nickel alloys, aluminum, impact, wear and corrosion resistant overlays and for metal working jobs. *Eutectic Welding Alloys Corp., Dept. HPAC, 40-40 172nd St., Flushing 58, N. Y.*

▸ *WELDING—The Fight Against Fahrenheit* is 12 page booklet describing importance of United States Patent System to its research, development of advanced metal joining alloys and processes. Traces history of welding from the 13th century. *Eutectic Welding Alloys Corp., Dept. HPAC, 40-40 172nd St., Flushing 58, N. Y.*

▸ *WROUGHT IRON PIPE*—Four page folder covers company's wrought iron pipe, hot rolled products. Discusses composition, lists properties, cites applications in heating and air conditioning systems, provides tables of piping data. *A. M. Byers Co., Dept. HPAC, Clark Bldg., Pittsburgh 22.* ‡

INDUSTRIAL
VENTILATION
HANDBOOK

A practical manual on fume removal, dust collecting, ventilating and exhaust systems for industrial plants. Tells how to design correctly and provide for various ventilation requirements . . . make measurements and analyses of fumes, mists and dusts . . . plan exhaust systems, etc. Twenty eminent authorities contributed also to detailed descriptions of systems in actual operation in many plants, whatever the manufacturing process. 154 pages of practical "know-how" reprinted from HP&AC. Send your order with only $1.50 ($1.75 foreign) to get it postpaid from

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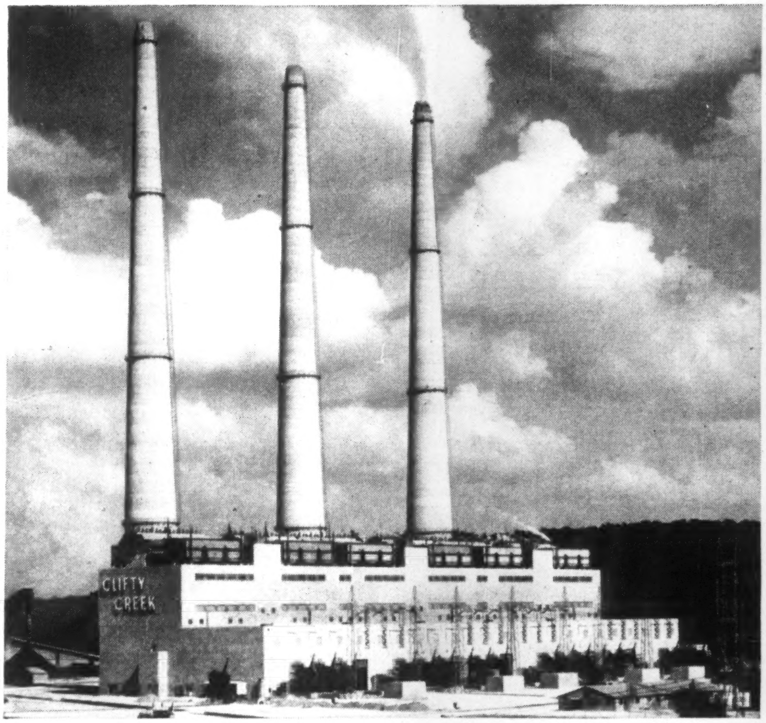


GIANT ON THE OHIO. Clifty Creek Plant at Madison, Ind., is the world's largest investor-owned power plant—with a 1,290,000 kilowatt capacity. The complex air conditioning requirements for this "big job" were met efficiently by General Electric Zone-by-Zone method.

General Electric

ZONE-BY-ZONE

Air Conditioning chosen for largest power plant ever built by industry

When air conditioning was selected for the giant Clifty Creek power plant, the engineers chose General Electric Zone-by-Zone method. Not only was this system most economical to install—but its flexibility permits a continuing economy in cooling costs.

General Electric Air Conditioning can be installed step-by-step, if desired, so that the investment at any time can be kept relatively low. Space presents no problem—ceiling-mounted units take no floor space and floor-mounted units may be stationed out of space. These smartly streamlined units are self-contained, trouble-free. And you'll always go right specifying General Electric products.

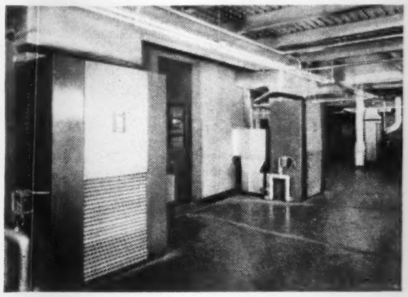
You owe it to your clients to consider General Electric Zone-by-Zone Air Conditioning in economically planning their requirements. General Electric Company, Commercial and Industrial Air Conditioning, 5 Lawrence Street, Bloomfield, N. J.

Progress Is Our Most Important Product

GENERAL ELECTRIC

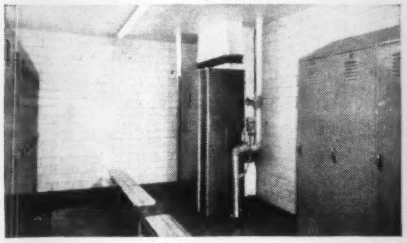
EACH ZONE INDIVIDUALLY COOLED BECAUSE EACH UNIT INDIVIDUALLY CONTROLLED

You air condition only the areas you need when you need it.

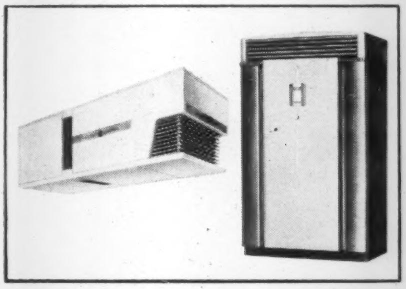


CONTROL ROOM at base of each of three stacks—tallest in the world—adequately air conditioned by 2 General Electric 10 ton Units. Third unit (located out of space) serves foreman's offices. Each of the 3 control rooms is air conditioned by General Electric Units in a similar manner.

CAFETERIA receives its cooling from a 10 ton and a 7½ ton unit. When area served is not in use, Zone-by-Zone Air Conditioners may be turned off without affecting other areas.



LOCKER ROOMS air conditioned by a 3 ton unit. In addition, all offices and laboratory have General Electric Zone-by-Zone Air Conditioning.



CEILING-MOUNTED UNITS *take no floor space*—available in 3, 5 and 7½ ton capacities, water-cooled; 3 and 5 ton air-cooled; **FLOOR-MOUNTED UNITS** in 3, 5, 7½, 10 and 15 ton capacities.

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SPECIFICATION

and BUYING

INFORMATION

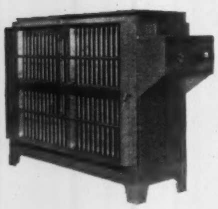
Use your complete, up-to-date

JANUARY DIRECTORY ISSUE

Your job will be a lot easier if you'll keep the January Directory issue of Heating, Piping & Air Conditioning constantly available for handy reference. It's one of your most valuable tools — one which will save you many hours of looking up the products you need for your various jobs. It's the ONE complete, up-to-date, readily accessible source of product information on who makes the pumps, valves, traps, compressors, specialties of all kinds, etc., you need — and where they're located. They're identified by trade names, too. EVERY product is listed, alphabetically arranged and printed on a distinctive yellow stock for easy reading and reference. Keep it handy . . . it's a time saver.

Searching for THE BEST
Electronic Air Cleaner?
I'm Warm-air
I'm Cool-air
I'm Electro-air

look no further... It's ELECTRO-AIR



THE TRIPLETS—Warm-air, Cool-air and Electro-air are everywhere.

New features such as a single, balasted circuit and selenium rectifiers assure service-free operation and high efficiency—90% as determined by the National Bureau of Standards dust spot Test.

Electro-air Electronic Air Cleaner Models of suitable dimensions and capacity are manufactured for every size commercial building, industrial plant and home.

All parts including selenium rectifiers are guaranteed for five years.

WRITE FOR CATALOG CB-20-B

ELECTRO-AIR CLEANER COMPANY
1285 REEDSDALE STREET, PITTSBURGH 33, PA.

Boom Rolls On

(Continued from page 151)

cept ASME construction without making it mandatory.

"Where ASME codes apply, these should be followed," says Mr. Heinrich.

"The heating, piping, and air conditioning industry would serve itself, its clients, and the public at large to much advantage by lending its full support to the objectives of safe, sound construction and a reasonably long period of usefulness for all pressure vessels."

Burn More Coal

BITUMINOUS COAL production for 1957 is estimated at 532 million tons by the National Coal Association, according to Carroll F. Hardy, managing director of the Bituminous Coal Institute.

This estimate is an increase of 22.4 million tons above 1956 production. It is based on two general assumptions: (1) that industrial production will continue to show growth in 1957 — by a probable four or five points on the Federal Reserve Board Index; (2) that the overseas demand, already up, will be increased as a result of the international crisis.

In the U. S., says Mr. Hardy, there is an increasing interest not only in specifying coal in new buildings but in converting existing installations to coal.

Noted also by the Institute is a trend toward the installation of standard boilers which may be fired by any fuel.

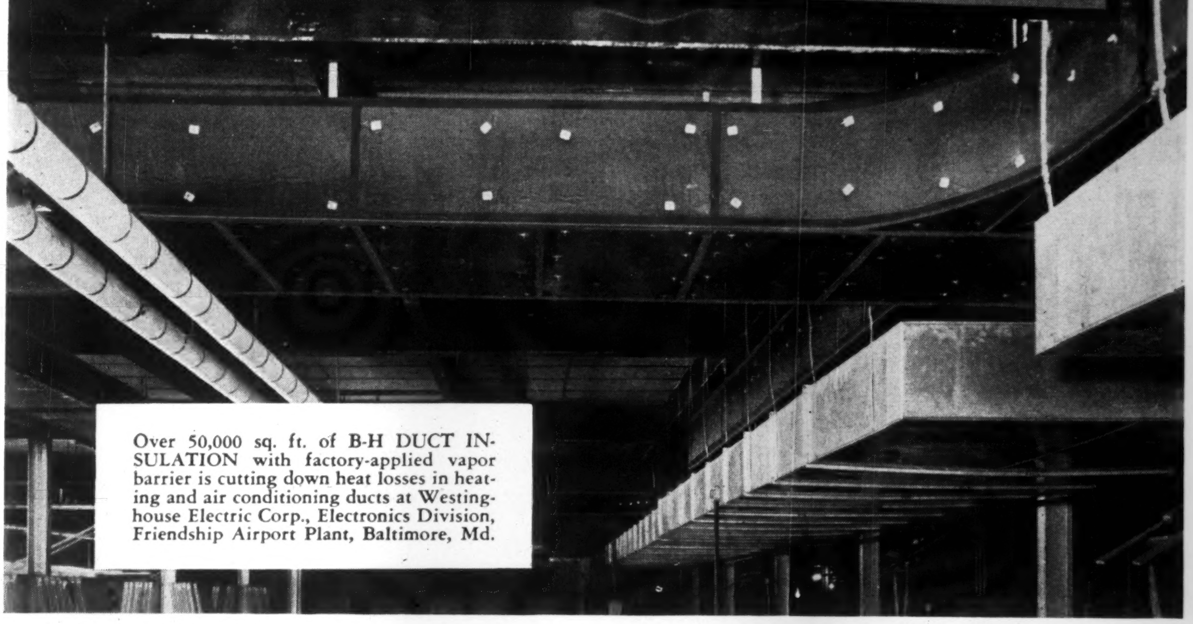
Further increases in anthracite production — on top of a 7 percent gain in 1956 — is the outlook for 1957 by the Anthracite Institute, says J. D. Jillson, vice president.

The reasons, says Mr. Jillson, are that "we believe that overseas exports will show further increases, that the industrial uses of anthracite will also show gains, and that the sale of automatic anthracite heating

(Continued on page 340)

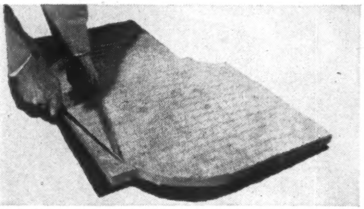
BALDWIN-HILL *Spun Mineral Wool*

BH DUCT INSULATION



Over 50,000 sq. ft. of B-H DUCT INSULATION with factory-applied vapor barrier is cutting down heat losses in heating and air conditioning ducts at Westinghouse Electric Corp., Electronics Division, Friendship Airport Plant, Baltimore, Md.

Insulation Contractor:
Wallace and Gale, Baltimore, Md.



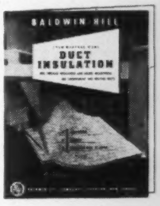
B-H Duct Insulation is easy to cut with a knife to conform to irregular flat shapes.

B-H Duct Insulation scored and being molded to curved surface of duct without cracking or breaking.

Speedy Application Lowers Cost of Insulating and Silencing Ducts

With B-H DUCT INSULATION so easy to apply—because of its light weight, easy cutting and scoring—you'll be the low bidder on many a job and be able to finish in the allotted time.

B-H DUCT INSULATION is made in semi-rigid sheets of spun mineral wool fibers, from 3/4" to 2" thick in nominal 7 lb. density. It is furnished with or without vapor barrier, or coated to prevent fiber entrainment. It is adaptable to various application methods—adhesive, clips, bands, screws and pins. With a smooth, clean surface, it is handled with bare hands—no splinters or fall-out of loose particles.



BALDWIN-HILL

DUCT INSULATION

Send for literature describing B-H DUCT INSULATION
and giving suggested methods of application
For other B-H products, see Sweet's Engineering File

BALDWIN-HILL COMPANY

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Kalamazoo, Mich. . . . Huntington, Ind. . . . Temple, Tex. . . . Wabash, Ind.

AirMpeler

LO-BOY
CENTRIFUGAL
ROOF EXHAUSTERS

Enhance The Beauty Of Building Skylines

Pats.
Pend.

Lowest Silhouette Design

Forward or Backward Curve Wheel Within . . . . or Out of Scroll Housing

Motor mounting on side of structure support . . . out of line of air stream reduces height of Lo-Boy models nearly 50% of older designs.

LOW WIND RESISTANCE
SIZES 10"-72" 600-47,000
CERTIFIED C.F.M. RATINGS

- QUALITY
- BEAUTY
- PROVEN PERFORMANCE

See Sweet's File 20c/Amm or Write for bulletin HA-100 57

AMMERMAN CO., INC.

110 North Second St.
Minneapolis 1, Minnesota

Boom Rolls On

(*Continued from page 338*)

equipment will continue to forge ahead."

At the end of 1956 it seemed likely that anthracite production for last year would approximate 26.7 million tons, compared with 25 million tons in 1955. Largely responsible for that gain, explains Mr. Jillson, are increased heating requirements and increased overseas exports.

The sale of automatic anthracite heating equipment for the first nine months of 1956 exceeded the corresponding 1955 period by 21 percent. These figures include both boiler-burner and furnace-burner integral units and conversion stokers.

"The use of anthracite for industrial purposes — in the manufacture of coke for sintering iron ore and for pelletizing of taconite — continues to show increases," he says.

Steel Pipe Shipments

SHIPMENTS of standard steel pipe may be slightly less in 1957 than for the past two years, according to George D. Lain, research engineer, Committee on Steel Pipe Research, American Iron and Steel Institute. The consumption of pipe will depend to some extent on the volume of construction. Subject to final figures shipments of standard steel pipe for 1956 appear very close to the record established in 1955, with a possibility of exceeding that year.

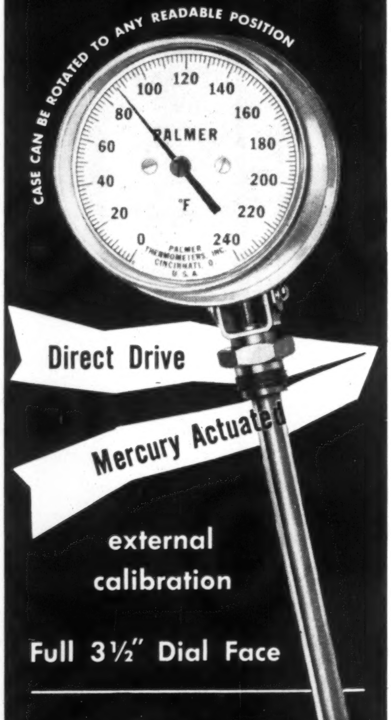
In 1957 the critical international situation could lead, he believes, "to necessary preferential treatment for other types of pipe such as oil country goods and line pipe. Although there is sufficient capacity to produce the standard pipe requirements, the semifinished steel to produce it might become limited to some extent."

Gas Expands Service

THE GAS UTILITY industry connected with its 30 millionth customer late last year, says Daniel Parson, direc-

(*Continued on page 342*)

PALMER
presents
an outstanding
improvement in
DIAL THERMOMETERS


CASE CAN BE ROTATED TO ANY READABLE POSITION
PALMER
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PALMER THERMOMETERS, INC. CINCINNATI, O. U.S.A.

Direct Drive

Mercury Actuated

external
calibration

Full 3½" Dial Face

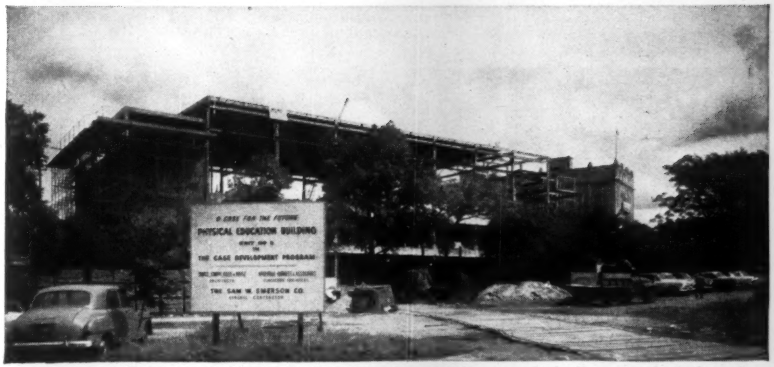
- No Sector
- No Pinion
- No Linkage
- Constant Accuracy
- Easy Readability

WRITE FOR BULLETIN 350

PALMER
THERMOMETERS, INC.
Norwood Ave., Cincinnati 12, Ohio
Mfrs. of Industrial Laboratory Recording and Dial Thermometers

Building "A Case for the future"

Cleveland's Case Institute approves GILSULATE® for underground hot pipe insulation



Major Expansion Program at Case Institute, leading Midwest technical center, includes plans for several new buildings. GILSULATE has been used and approved by Case on these projects.

300-Foot Replacement Line for existing buildings. Case is replacing all lines with GILSULATE. Thus far, 1900 feet of GILSULATE-protected steam and return lines are on the Case campus.

Pouring GILSULATE is a simple job. Plywood forms conserve material. This is a close-up of the pipe run shown at the left. No special equipment is required during handling.

Shovel Pointing works GILSULATE between and under the pipes, filling all the voids. GILSULATE is ideal for use under roads and pavements, has a high load bearing capacity.

Tamping is the next step. It firms the GILSULATE bed prior to curing. Backfilling, seen in the overall view, is the final step. Few men are needed on a GILSULATE job.

Two-year-old Line on Case campus, dug up for experimental purposes, shows pipes to be in perfect condition, with intact GILSULATE protective structure.

Facts about Gilsulate

1. EASY TO USE—just pour and tamp...pipe heat does the rest.
2. FORMS 3 ZONES of protection against heat loss and all hazards commonly encountered by hot buried pipes.
3. NEEDS NO HOUSING OR MECHANICAL SHEATHS: no mixing, special handling or equipment.
4. ONLY NEEDS NORMAL PIPE SPACING: for multiple pipe or cramped conditions.
5. THREE TYPES AVAILABLE:
   Type A for 220°-300°F temp. range
   Type B for 300°-385°F temp. range
   Type C for 385°-520°F temp. range

GILSULATE®

The Triple Zone Insulation System for Lifetime Protection of Underground Hot Pipes

For complete information on GILSULATE Insulation, write any of our offices:

AMERICAN GILSONITE COMPANY
Affiliate of Barber Oil Corp. & Standard Oil Co. of Calif.
134-B West Broadway, Salt Lake City 1, Utah
3537 Lee Road, Cleveland 20, Ohio

INCREASE YOUR ABILITY TO

HANDLE MORE COOLING TOWER JOBS

EASIER • BETTER • PROFITABLY

with *Packaged* **AURORA®**
CLOSE-COUPLED AIR-CONDITIONING PUMPS

AURORA Always PUMPS

for
EVAPORATOR COOLING TOWERS
•
AIR CONDITIONING UNITS
•
also for
GENERAL SERVICE

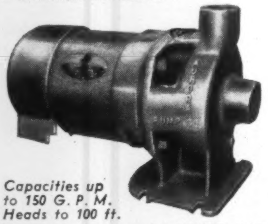
These are outstanding pumps, high in favor with air conditioning contractors and manufacturers of air conditioning equipment. Mechanical seal requires no packing or maintenance. Disassembly without disturbing pipe connections or hold down bolts.

- LOW COST
- SMOOTH, QUIET
- DEPENDABLE
- LONG LIVED
- MECHANICAL SEAL
- DISASSEMBLY is QUICK, SIMPLE
- CARRIED IN STOCK

CASINGS
Vertically split. Casing wearing ring standard.

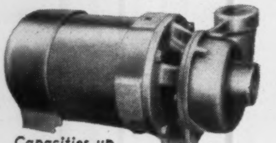
MECHANICAL SEAL
Standard, located in packing cover.

IMPELLER
Balanced, enclosed type, high grade bronze.



Capacities up to 150 G. P. M. Heads to 100 ft.

AURORA TYPE JMC Close-Coupled Pump



Capacities up to 85 G. P. M. Heads to 40 ft.

AURORA TYPE SAC Close-Coupled Pump

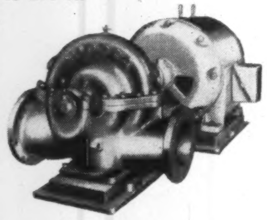
MOTOR
NEMA specs, stainless steel shaft on JMC and SAC—for all circuits and various enclosures.

BALL BEARINGS
Built into motor on JMC and SAC

OTHER AURORA AIR CONDITIONING UNITS

We are also in a position to supply various sizes of air conditioning pumps in V-Belt drive, and flexible coupling drive. Our large size GMC Close-Coupled Pumps can be furnished up to 800 G. P. M. and heads to 200 ft.

ALSO—AURORA SPLIT CASE CENTRIFUGAL PUMPS
—single and two stage for water supply, handling condenser circulating water, brine circulation, booster service and many other duties.



Complete Information on Request

AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
80 LOUCKS STREET • AURORA • ILLINOIS
INTERNATIONAL SALES OFFICE • 90 WEST ST. • NEW YORK 6, N. Y.

Boom Rolls On

(*Continued from page* 340)

tor of the bureau of statistics, American Gas Association.

Natural gas service is now provided in 45 states and the District of Columbia, with Idaho to be added shortly. Manufactured gas service is available in two other states: Maine and Vermont.

A number of important milestones are anticipated in the near future. Nearly 1 million additional new customers will be connected during each of the next 9 years, attaining an average of 38¼ million customers by 1965.

Total sales of gas in 1965 by utilities and pipe lines will aggregate 116 billion therms, an increase of 73 percent from the current level. To meet these increasing demands for gas service, the industry will spend nearly $19 billion between 1956 and 1965.

Total revenues of the industry, almost $3½ billion in 1955, will approach $7 billion by 1965.

Increase Welding Output

"THE EMPHASIS in the future for the welding industry will be for greater productivity," says John J. Chyle, president of the American Welding Society.

"With the tremendous amount of research and development being conducted in all fields of welding, it is only natural that new processes and procedures are continually being developed. One of the newest welding processes that has become important in welding carbon steel at the present time is the use of CO_2 gas shielded welding.

"Improvements have also been made in the spot welding of thin sheet materials by the use of automatically controlled inert gas spot welding type of equipment.

"In the field of brazing thin sheet metals, new brazing materials have been developed with free flowing properties. These are primarily used in the joining of stainless steel sheets together where brazing is employed. These new brazing alloys can also be applied to stainless steel, high strength materials, as well as carbon steel sheets."

Copper and Brass Bright

PROSPECTS for the copper and brass mill industry in 1957 appear "most favorable" to T. E. Veltfort, manager of the Copper & Brass Research Association.

"The copper supply situation appears very bright. Copper production here and in the free world abroad has shown substantial increases, and current figures indicate that copper mining capacity will continue to grow at home and overseas, year by year for some time to come.

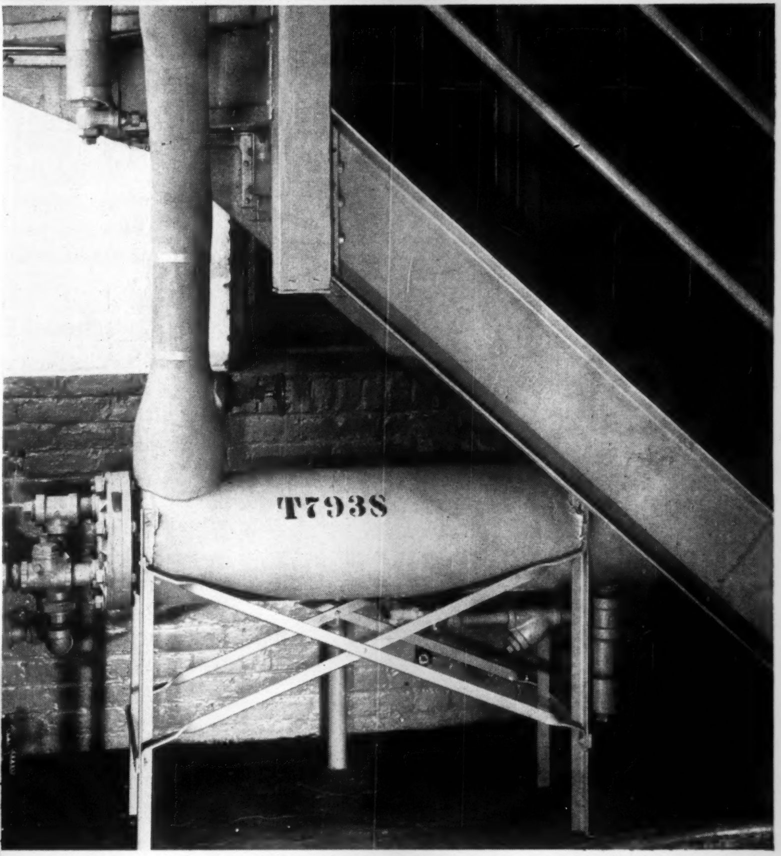
(*Continued on page* 344)

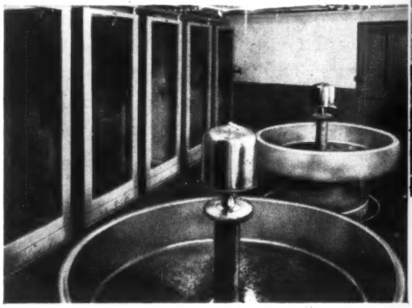
ECONOMICAL HOT WATER SOURCES FOR MODERN INDUSTRY

The Gorham Company

Remodels Hot Water System for Savings and Simplicity . . .

with **GENERAL** instantaneous Water Heaters





This neat, out-of-the-way GENERAL Instantaneous Water Heater installation supplies plenty of continuous hot water for 5 single showers, 2 Bradley "48" wash-basins, 4 sink taps, and 12 combination faucets at The Gorham Company, Providence, R. I. Measuring only 11⅞" in diameter by 42½" in length, it can deliver up to 47 gallons per minute of hot water, raised from 40° to 140° with steam input of 5 psi.

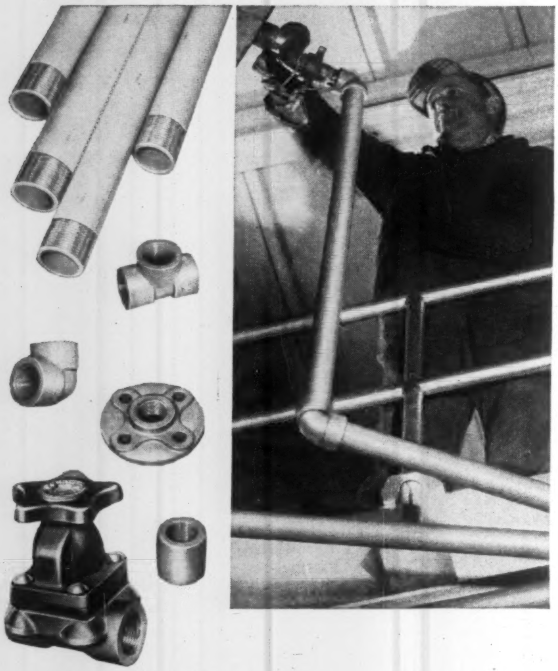
Modern, high-efficiency "spot" sources of hot water are rapidly replacing long piping runs at The Gorham Company, famous silversmiths. In a long-range remodeling program, the company is installing GENERAL Instantaneous Water Heaters wherever possible to serve separate groups of showers, sinks, wash-basins, and cafeteria facilities.

GENERAL Water Heaters install quickly and easily near the steam line . . . require no bulky storage tank or complicated piping. Besides simplifying installation and saving time and insulation costs, they minimize heat loss.

This is a typical example of the extra economy and efficiency GENERAL Instantaneous Water Heaters are providing as spot sources of hot water in modern industrial plants. They're equally effective when used as booster installations, or in complete, centralized systems.

There's a wide range of capacities available up to 300 gallons per minute. For use with live or exhaust steam at 5 to 125 psi, or boiler water. Write for Catalog 61. General Fittings Company, Box 151E, East Greenwich, Rhode Island.

GENERAL FITTINGS
COMPANY
TANKLESS AND INDIRECT WATER HEATERS AND HEATING SPECIALTIES



Peak Performance by

Van-Cor

PIPING

An Ohio plant was faced with high pipe maintenance costs because the acetic acid produced is strong enough to eat holes in steel. Instead they installed Van-Cor plastic piping that is still good as new after 18 months' service.

Van-Cor pipe, fittings and valves have solved similar problems with scores of corrosive chemicals. An unplasticized polyvinyl chloride, Van-Cor weighs less, and is easier to install, than conventional piping. It serves longer, thus costs far less . . . Van-Cor sheets are also fabricated into ducts, hoods, tanks, fumestacks, etc.

INVESTIGATE!

Write for Bulletin, Specifications and Name of Nearest Distributor.

INDUSTRIAL DIVISION OF
COLONIAL PLASTICS MFG. CO.

SUBSIDIARY OF THE VAN DORN IRON WORKS CO.
2685 EAST 79th STREET • CLEVELAND 4, OHIO

Boom Rolls On

(Continued from page 342)

"Moreover, the copper and brass mill industry will continue to expand and improve its fabricating facilities and products to keep pace with the general growth and advancement in all industries. This assures that the supply of copper and brass mill products will be adequate to meet the future demands of an expanding economy.

"During 1956 our association approved a color coding system for the various types of copper tube which will prove to be helpful to heating, piping, and air conditioning contractors, we believe."

Overhead Expenses Rise

WHAT IS the outlook for business management in general in 1957? George D. Wilkinson, president of George D. Wilkinson Co., consultants in management, sums it up as follows:

"The trend in overhead expenses will continue in 1957. As in the past several years expense will continue to rise faster than sales income. Companies which ignore this situation will find themselves in a double squeeze. Faced with decreasing profit margins, they will find it harder and harder to find the money to pay for mounting expenses.

"I look for many companies which have been making nominal profits to begin to show losses unless volume increases greatly. On the other hand, companies which are making the effort to combat rising expenses by increasing productivity should be able to face 1957 with confidence. ‡

Photos on pages 146 and 149 courtesy Worthington Corp.

NOW is the time to consider

SNOW MELTING

Systems around Buildings and Grounds

Better send at once for our SNOW MELTING MANUAL. Here are design data based on a study of—and others' actual experience with over 100 snow melting systems of all kinds for

- LOADING PLATFORMS and DOCKS
- SIDEWALKS • ROADS • DRIVEWAYS
- MARQUEES • PARKING AREAS
- RUNWAYS • RAILWAY SWITCHES

and other applications which HAVE proved that this modern method of snow removal costs no more than other methods.

Complete information on the correct design, installation and operation of snow melting systems is offered in the new SNOW MELTING MANUAL, a reprint of articles originally published in HEATING, PIPING & AIR CONDITIONING. Fifty cents per copy.

Heating, Piping & Air Conditioning
6 North Michigan Avenue **Chicago 2, Illinois**

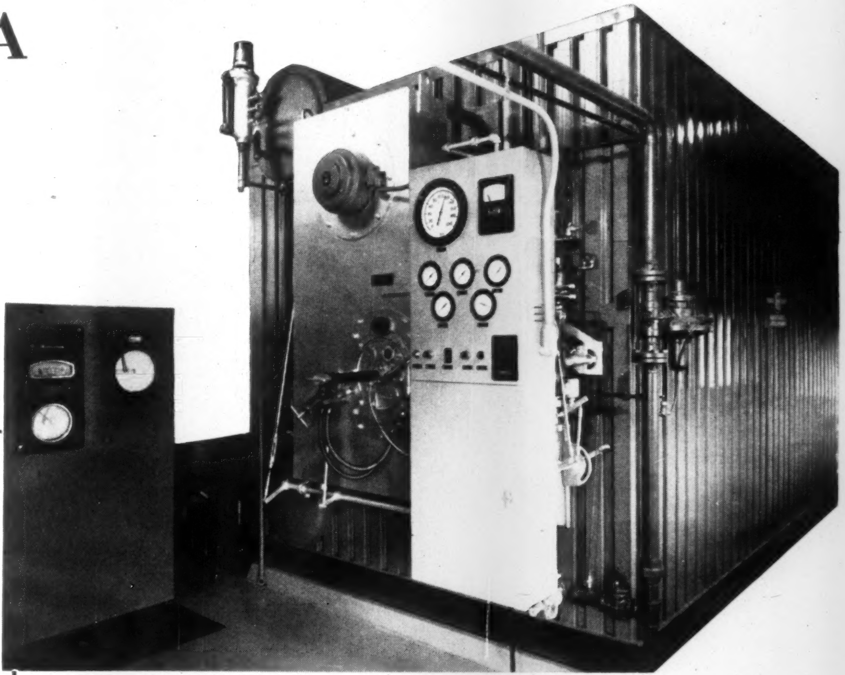
BIG WATER TUBE BOILER PERFORMANCE

...in a Package Boiler!

NEBRASKA BOILERS

are

"Made For The Job"



- **A COMPLETE STEAM BOILER PACKAGE**

  — Factory assembled, tested and shipped — from one dependable source

- **FULLY AUTOMATIC OPERATION**

  — Gas, Oil or combination fuels

- **SIZES UP TO 30,000 lb./hr. OF STEAM**

  — Available in 18 models with standard design pressures up to 160 psi — higher design pressures available

- **BURNER AND CONTROL SYSTEMS FOR EVERY NEED**

  — Only burners, combustion control equipment, flame failure safeguards and accessories which are distributed and serviced nationally, are used

- **ASME CODE CONSTRUCTION**

- **RESERVE CAPACITY**

  is built into every NEBRASKA BOILER for quick start-up, fast response to load changes, economy of operation, and long life.

There's no substitute for dependable performance in any boiler installation and that's one reason why you should give serious consideration to NEBRASKA BOILERS for your next job.

STEAM GENERATION

Radiant surface surrounding furnace generates 2/3 of boiler output.

Abundant convection surface assures low stack temperatures.

Natural circulation over all the heating surface.

High quality Steam — released uniformly along length of boiler steam drum.

HEAT TRANSFER

Uniform distribution of temperature over the Heating Surface.

Cross flow of hot gases. 3 pass design. No localized overheating.

COMBUSTION

Temperature — refractory surface properly placed and proportioned; maintains effective furnace temperature.

Time—liberal furnace volume allows sufficient time.

Turbulence — proper mixing of fuel and air by the properly selected burner produces turbulent, stable flame.

FIRING EQUIPMENT AND CONTROLS

Most dependable, fully-automatic firing equipment used for gas, oil or combination fuels.

Utilizes only burners, combustion control equipment, flame failure safeguards and accessories with national distribution and service.

Forced draft and induced draft are available.

DEPENDABLE PERFORMANCE

Instantaneous response to load changes.

Produces steam quickly from a cold start.

No moving parts — low heat release rates (see engineering data) — constant reliable steam generation.

CONSERVATIVELY RATED

Operates at NOMINAL capacity — economy, efficiency at highest peak.

Operates at maximum capacity — no sacrifice in either economy or efficiency.

Reserve Capacity — quicker start, faster response to load changes, longer life.

Nominal evaporation rates.

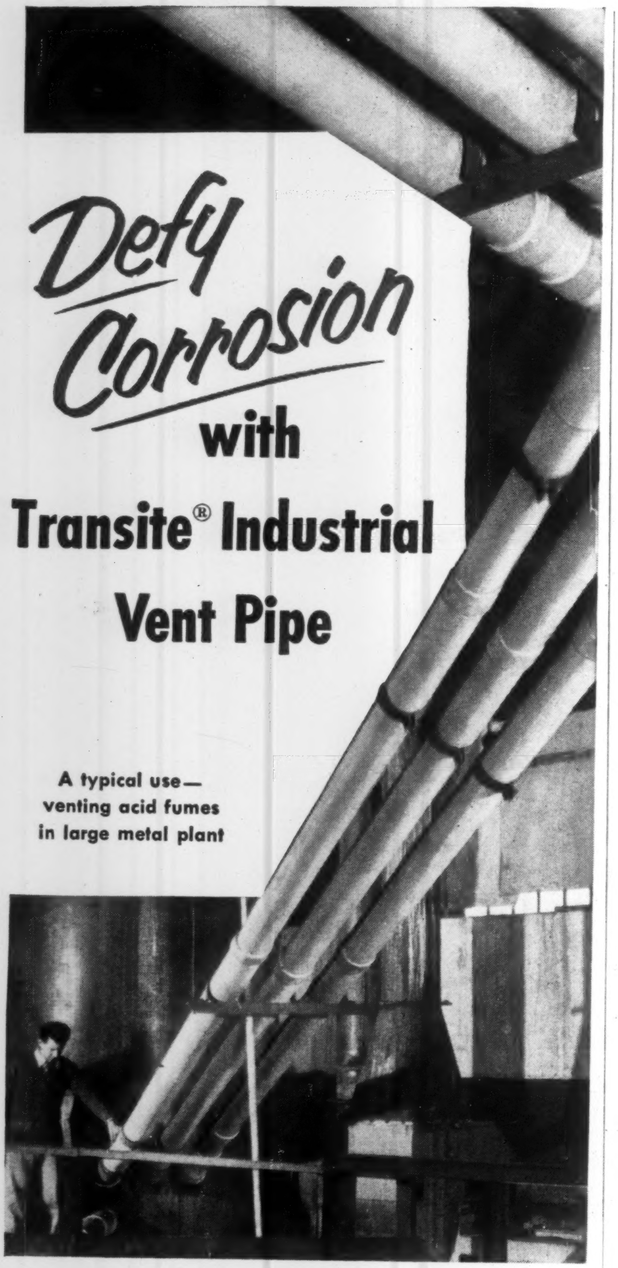
ACCESSIBILITY

Adequate access openings.

Easy external, internal inspection and cleaning.

We have more complete information on this superlative boiler line available, and will gladly send it upon receipt of your request. Please write at once.

Nebraska Boiler Co., INC., **LINCOLN NEBRASKA**


Defy Corrosion with Transite® Industrial Vent Pipe

A typical use—venting acid fumes in large metal plant

IN SEVERE VENTING SERVICES, Transite's outstanding performance is a matter of record. Made of asbestos and cement, two of nature's most indestructible materials, it resists the attack of most fumes, vapors, and dusts.

Installed indoors or out, Transite Industrial Vent Pipe can't rust or rot, never needs paint, nor other protective coating. Wide variety of fittings makes it adaptable to any layout. For more information, write Johns-Manville, Box 14, New York 16, N.Y. In Canada, Port Credit, Ontario.

JOHNS-MANVILLE JM PRODUCTS

Johns-Manville
TRANSITE INDUSTRIAL VENT PIPE
An Asbestos-Cement Product

WHO'S WHAT...

(New personnel, promotions)

▸ *CRANE CO.*—Frank F. Elliott, chairman of the board of directors. Mr. Elliott is succeeded as president of the company by Neele E. Stearns, formerly vice president of planning and development of Inland Steel Co.

▸ *NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSOCIATION*—Newly elected officers are: president—Frank L. Meyer, Meyer Furnace Co.; first vice president — Tom Byrd, Lau Blower Co.; second vice president—C. L. Sapp, Farquhar Furnace Co.; managing director and secretary-treasurer—George Boeddener. Reelected for second terms to the board of trustees are J. F. Knoff, Airtemp Div., Chrysler Corp. and T. W. McNeill, Air Conditioning Div., American Radiator & Standard Sanitary Corp. New members elected to the board of trustees are H. F. Randolph, International Heater Co.; Homer Brundage, Brundage Co.; Eugene J. Cullen, Inland Steel Products Co.

▸ *AMANA REFRIGERATION, INC.*—Francis A. Noll, director of engineering; Joseph E. Guertin, manager of new builder sales department; Leonard J. Sahs, assistant chief engineer of air conditioning division; Harlan J. Lortz, process engineer in charge of engineering quality control, processing program.

▸ *BORG-WARNER CORP.*—Henry M. Haase, vice president in charge of engineering and research.

▸ *PRAT-DANIEL CORP.*—Conrad H. Pinches, president; Louis C. Whiton, chairman of the board.

▸ *YOUNGSTOWN SHEET AND TUBE CO.*—J. L. Mauthe, chairman of the board; A. S. Glossbrenner, president, succeeding Mr. Mauthe; Walter E. Watson, vice chairman of the board; William H. Yeckley, vice president of operations; Frederick M. Mayer, vice president.

▸ *OHIO BRASS CO.*—George L. Draffan, chairman of the board and chief executive officer; Roger A. Black, president and chief administrative officer, succeeding Mr. Draffan.

▸ *A. W. CASH CO.*—William Schupner, chief engineer for fluid power products.

▸ *CARRIER CORP.*—Owen Kuhen, product specialist for large capacity absorption refrigeration equip-

Mark of Integrity

...in reporting circulation facts

We display the Audit Bureau of Circulations* symbol with pride! It's our mark of circulation integrity!

The seasoned marketing man finds trustworthy data vital in his work of advertising media evaluation. And *reliable net paid circulation figures* are among the most valuable facts he uses in selecting printed media for his advertising campaigns.

Once every advertiser guessed about circulation accuracy and gambled on advertising results; today he need not question the wealth of data in any A.B.C. audit report, for it contains only *verified* answers to his most searching circulation queries.

* * *

When a media director or advertiser asks us, "How much paid circulation? What do your readers pay? Where does your circulation go? How do you get circulation—your audience for my advertising?", we need only show him our latest A.B.C. audit report. There he finds factual answers that annually pass the test of a trained A.B.C. circulation auditor's scrutiny.

And any buyer of space can decide for himself, with confidence, the value of our circulation audience. Our A.B.C. membership means circulation reported in accordance with recognized, impartial standards, established by buyers and sellers of space working together in A.B.C.

Publishers who meet the Bureau's high standards know the A.B.C. symbol as a mark of circulation integrity. The value-wise advertiser, too, has learned that *the A.B.C. symbol is his dependable guide to the audited facts* about net paid circulation that protect his advertising investments.

*The Audit Bureau of Circulations, founded in 1914, is a cooperative, nonprofit association of the leading buyers and sellers of advertising space. A.B.C. sets standards for net paid circulation, audits and reports circulation facts. **To be sure of what your print media dollar buys—look for the A.B.C. symbol.**

Heating, Piping & Air Conditioning

MEASURE OF SERVICE...MARK OF INTEGRITY

Keep Pace ...
CUSTOM BILT RESIDENTIAL AIR CONDITIONING
Exclusively for Commercial-Institutional!
SPOTAIRE
FLOCOLD
HOT SHOT
NOW!
SPOTAIRE LRC
SPASAVER
PERMA-FAN
Control-Plant Air Conditioners...
Flexzone
Ideal for cutting and packaging rooms
HELPFUL AIR CONDITIONING
...REFRIGERATION DATA
Yours Free! *
SPOTAIRE VRC
AIR COOLED CONDENSER
COOLING TOWER
PACKAGED WATER CHILLER
The New FLOCOLD
SPASAVER
AIR HANDLING U
drayer-hanson
Extended Surface for STEAM-WATER and DIRECT EXPANSION
Guarantee Customer Satisfaction

Yes...
I would like to receive complete data. ( )
Or, just send me items checked. ( )

SINCE 1910
drayer-hanson

3301 Medford Street • Los Angeles 63, California
(Division of National-U.S. Radiator Corporation)

WHO'S WHAT

Continued

ment; Robert J. McMahon, retail advertising manager; William J. Gamble, coil department manager of Unitary Equipment Div.

▶ *A-P CONTROLS DIV., CONTROLS CO. OF AMERICA*—Stanley A. Johnson, director of manufacturing.

▶ *AIR-CONDITIONING AND REFRIGERATION INSTITUTE*—Robert H. Luscombe, a director. Mr. Luscombe is general sales manager of Penn Controls, Inc.

▶ *LAU BLOWER CO.*—William E. Prather, vice president of plants and facilities.

▶ *TORK TIME CONTROLS, INC.*—John H. Beier, chief engineer.

▶ *COPELAND REFRIGERATION CORP.*—Frank J. Gleason, president.

▶ *MILWAUKEE VALVE CO.*—Carl E. Rowe, vice president and general manager. Mr. Rowe was also made a director of the firm.

▶ *TUTTLE & BAILEY DIV., ALLIED THERMAL CORP.*—Donald D. O'Neill, general sales manager; Richard D. Tutt, director of marketing; Robert S. Rickabaugh, to direct sales of electrical and electronic devices which are in process of development; Frank W. Adams, sales manager of air distribution products division; William L. Batchelor, chief engineer.

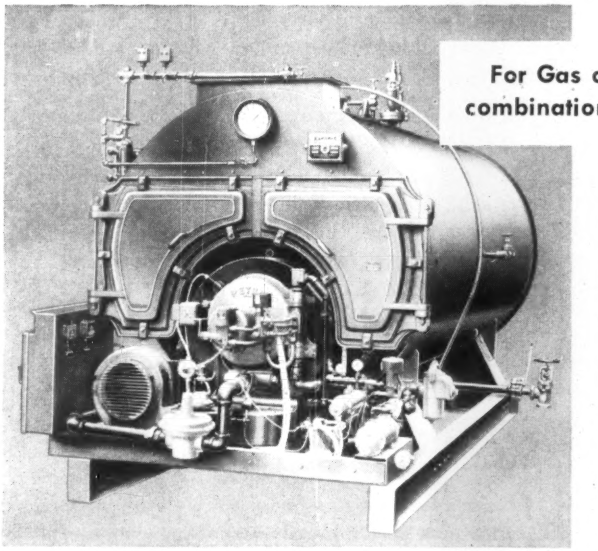
▶ *AMERICAN AIR FILTER CO., INC.*—C. A. Pickett, manager of sales department within product and marketing division; John J. Willis, transferred to Illinois Engineering Co., an AAF subsidiary, to become its sales manager and assistant to general manager; John W. Frazier, sales promotion manager.

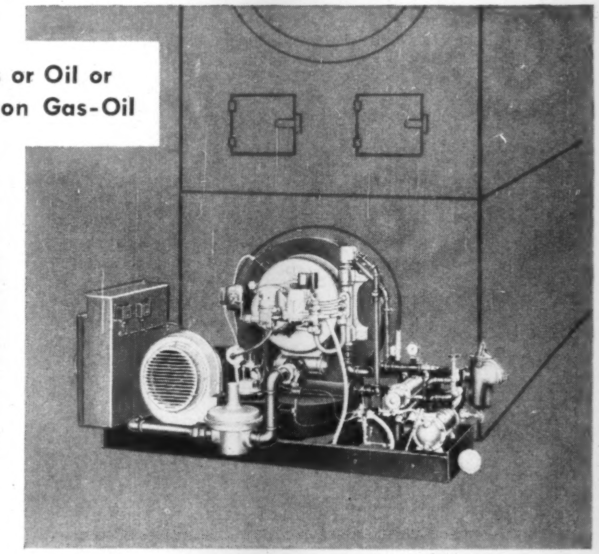
▶ *MINNEAPOLIS-HONEYWELL REGULATOR CO.*—Carl Swanson and Russ Keppel, product manager and market manager, respectively, for commercial and industrial burner controls; Richard E. Hoppe, Jr., director of employee training.

▶ *WESTINGHOUSE ELECTRIC CORP.*—Donald R. Meckstroth, manager of marketing for package products department of air conditioning division;

How to use a Petro forced draft firing system

For Gas or Oil or combination Gas-Oil





1 Petro firing unit integrated with matched Scotch boiler as a complete boiler-burner unit

Here is a complete firing system available in a single unit. Installation consists of little more than securing the unit to the boiler and attaching fuel and power lines. No pitted boiler settings; no high stack. It is a thoroughly engineered unit, with all vital components matched and mounted on a single base. Includes burner (for gas, oil, or dual-fuel), factory mounted, refractory tile burner throat, secondary air volume control, motor driven forced draft fan and electrical control panel.

2 Petro firing unit can be applied to all types of boilers. Entire system factory built, wired and tested.

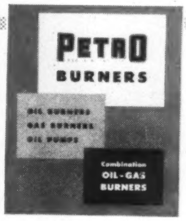
This is not a simple conversion burner—it is a complete firing system. Units are engineered to operate either under normal firebox draft conditions, or under positive pressure in sealed firebox boilers which are designed for operation under furnace pressure. A wide range of sizes is available for high or low pressure steam, or hot water for heating, processing and power requirements. Models are available for firing No. 6 or lighter fuel oils, and all types of fuel gas.

A Petro engineered system brings maximum dependability and operating efficiency

Savings in installation time, fuel, maintenance and operating costs are the result of Petro's half century record of thorough DEPENDABILITY. The most wanted features in a modern firing unit are contained in a Petro *complete* packaged forced draft burner system. Engineering service covers the nation.

Send for this PETRO® catalog

Over 50 years of leadership in automatic heating and power equipment



PETRO, 3527 W. 106th Street, Cleveland 11, Ohio.
In Canada, write to 2231 Bloor St., W., Toronto, Ontario.

Please send me literature and specification sheets on the money-saving Petro forced draft firing system.

Name________________
Company________________
Address________________
City________________ State________

Type F

Slot STRIPLINE DIFFUSERS by AGITAIR® Slot

Type S

STRIPLINE combines the best features of both slots and efficient air diffusers to provide equalized air flow throughout its entire length.
STRIPLINE slot diffusers are slenderly designed, inconspicuous, practical and versatile.
These slot diffusers can be located in walls, ceilings, coves, moulds, window reveals and stools or almost anywhere to suit interior design.

Type H

Write for complete Stripline Catalog.

AIR DEVICES INC. • 185 MADISON AVENUE • NEW YORK 16, N. Y. • AIR DIFFUSERS • FILTERS • EXHAUSTERS

John A. Gilbreath, manager of newly organized air conditioning wholesaling department.

▸ *OLIN MATHIESON CHEMICAL CORP.*—Albert J. Berdis, corporate vice president in charge of aluminum fabrication; Harry E. Gude, general manager of Omal, Ohio, rolling mill of company's aluminum division.

▸ *WHIRLPOOL-SEEGER CORP.*—John L. Bricker, vice president, marketing; Robert L. Evans, vice president, personnel; William E. Mahaffay, vice president, engineering; Edward C. Cudmore, controller; Juel M. Ranum, director of public relations.

▸ *SUPERIOR COMBUSTION INDUSTRIES, INC.*—Gen. James A. Van Fleet, a director.

▸ *BITUMINOUS COAL RESEARCH, INC.*—Dr. Richard A. Glenn, supervising chemist.

▸ *WOLVERINE TUBE, DIV. OF CALUMET & HECLA, INC.*—Robert C. Crowe, manager of industrial sales; Rod T. Davies, manager of aluminum sales; Jack Sheehan, manager of wholesaler sales.

▸ *BULLARD CO.*—C. J. Wilson, director of manufacturing.

▸ *A. O. SMITH CORP.*—U. T. Kuechle and Roy A. Dingman, vice presidents; Robert A. Rietz, assistant secretary; Charles E. Bulloch, director of product development.

▸ *McGILL MFG. CO., INC.*—William L. Ullom, assistant chief engineer; William A. Vitiello, design and application engineer; Theodore R. Stengel and Donald A. Delp, design engineers.

▸ *AIRTEMP DIV., CHRYSLER CORP.*—J. D. Loveley, chairman of American Society of Refrigerating Engineers' air conditioning conference held in November. Mr. Loveley is vice president in charge of engineering for Airtemp.

▸ *BRUNNER MFG. CO.*—Wallace J. Hoeing, sales manager; A. G. Zumbrun, Jr., transferred from Gainesville, Ga., plant to Utica, N.Y., as supervisor of sales, refrigeration; Paul A. Hunker, formerly at

FOSTER ENGINEERING COMPANY

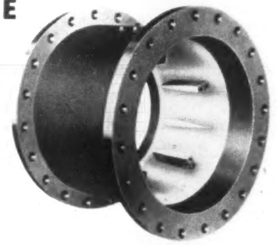
835 Lehigh Avenue, Union, N. J.

Agents in Principal Cities
(See listings under "Valves," "Regulators" and "Meters"
in the Classified Section of Your Telephone Directory)

Albany, N. Y.
Asheville, N. C.
Atlanta, Ga.
Baltimore, Md.
Boston, Mass.
Brooklyn, N. Y.
Buffalo, N. Y.
Charleston, W. Va.
Charlotte, N. C.
Chattanooga, Tenn.
Chicago, Ill.
Cincinnati, O.
Cleveland, O.
Columbia, S. C.
Denver, Colo.
Detroit, Mich.
El Paso, Tex.
Erie, Pa.
Greenville, S. C.
Houston, Tex.
Indianapolis, Ind.
Kansas City, Kansas
Los Angeles, Cal.
Memphis, Tenn.
Milwaukee, Wis.
Minneapolis, Minn.
Newark, N. J.
New Haven, Conn.
New Orleans, La.
New York, N. Y.
Norfolk, Va.
Oklahoma City, Okla.
Omaha, Neb.
Philadelphia, Pa.
Pittsburgh, Pa.
Richmond, Va.
Roanoke, Va.
Rochester, N. Y.
San Francisco, Cal.
Scranton, Pa.
Seattle, Wash.
Syracuse, N. Y.
Toledo, O.
Washington, D. C.
Wichita, Kans.
Wilmington, Del.

Also in principal cities in Canada and other countries.

*Gentile** FLOW TUBE



The Gentile Flow Tube is an impact-type head meter designed for accurate measurement and regulation of fluid flow. It consists, essentially, of a short spool piece, the inner periphery of which is equipped with two groups of pressure nozzles, one group pointing upstream and the other downstream. The nozzle groups are inter-connected by common pressure rings from which connections are made to the high and low pressure sides respectively, of a conventional indicating, recording or integrating meter. Flow Tubes differ from other variable head meters in that the taps are located at points of equal cross-sectional area. Therefore, the differential developed is a function of the velocity head and independent of the static head.

Flow Tubes are compact, comparatively light weight, relatively low in cost, and are easy to install since they require straight runs entering and following only when installed near throttling valves or regulators. And, Flow Tubes are available in types and D/d ratios to provide differentials that can be accurately measured with the least head loss.

Flow Tubes are furnished with head capacity curves based on laboratory tests. These data furnished with each Flow Tube makes our guarantee of exceptional metering accuracy possible.

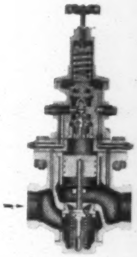
For further information, write us, and for specific recommendations, send us necessary flow data.

*Gen-til-'ly

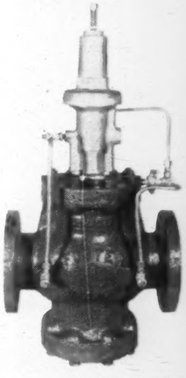
FOSTER ALSO MAKES . . .

Back Pressure Valves, Automatic Stop and Check Valves, Altitude Valves, Fan Engine Regulators, Temperature Regulators, Pump Governors, Float and Lever Balanced Valves, Non-Return Valves, Vacuum Regulators, Safety Valves and Control Valves.

PRESSURE REGULATORS



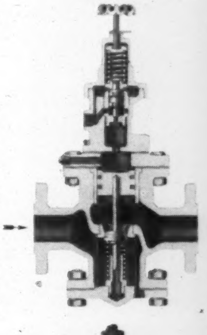
Foster Pressure Regulators provide the simplest automatic control of steam, liquid or gas pressures within required limits. They are available in a wide range of types and designs—direct acting for average regulation, or internal pilot-operated to provide practically instrument control; double-seated for continuous flow or single-seated for dead-end service.



Foster Type 50-G2 Regulators for steam are internal pilot operated for extreme accuracy-approaching instrument control. They are designed to handle a very wide reduction, and often eliminate the need for a secondary stage valve. May be arranged for remote control. Available for initial pressure from 25 to 1200 P.S.I.G.; for temperatures to 950°F; and reduced pressures from controlled vacuum of 15" H.G. to 600 P.S.I.G.

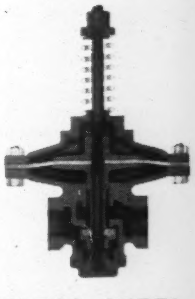
Foster Type U-2 Regulators for water, and for air, non-corrosive liquids and gases, are pilot controlled, piston actuated, single seated, with balanced main valve. They are designed for sensitive response with full valve action for sudden or wide changes in flow, while maintaining the reduced pressure within close limits. Available for initial pressures up to 300 P.S.I.; for temperatures to 190°F; and reduced pressures from 5 to 175 P.S.I.

RELIEF VALVES



Foster Automatic Pressure Relief Valves are designed to provide dependable, adjustable non-pop type of control, relieving excess pressure to a lower pressure or to atmosphere. Diaphragm or piston actuated, depending on the service, and the required regulation. The Foster Type R-4 Relief Valve illustrated is spring loaded, adjustable, with an internal pilot operated main valve. Single seated, tight closing, and suitable for dead-end service. Provides practically instantaneous relief of excess pressure with minimum build-up.

VACUUM BREAKERS



Foster makes a complete line of spring loaded automatic valves for use in vacuum service—with simple types for protection of stills, heater shells and similar equipment against collapse when cooling down, and more sensitive types for close control of vacuum in manifolds, air lines and vapor lines for various processing requirements. Type V, illustrated, is direct acting, diaphragm actuated. For vacuum to 28" H.G. maximum; for pressures to 125 P.S.I.

FOSTER VALVES ARE NOW AVAILABLE IN ALL TYPES OF STAINLESS STEEL

WHO'S WHAT

Continued

Utica, transferred to Gainesville as supervisor of sales, hermetic division.

▶ *EVANSVILLE DIV., BENDIX-WESTINGHOUSE AUTOMOTIVE AIR BRAKE CO.*—Richard J. Gerard, Jr., manager of production control; Edmund A. Tenbarge, material control supervisor; Alvin J. Knapp, material handling supervisor.

▶ *K S M PRODUCTS, INC.*—Anthony Maladra, sales manager, stud welding division.

▶ *SOUTHWEST RESEARCH INSTITUTE*—Robinson Brown, head of newly created mechanical development section of department of engineering mechanics.

▶ *HOLMES & NARVER, INC.*—John A. Brownlie, vice president in charge of business development for the Los Angeles engineering and construction firm.

▶ *HAYS MFG. CO.*—James B. Cook, Jr., sales manager of general products division.

▶ *STURTEVANT DIV., WESTINGHOUSE ELECTRIC CORP.*—Alexander Martin, sales manager, power apparatus; Hiram W. Rainey, Jr., field sales manager, succeeding Mr. Martin.

▶ *ANSUL CHEMICAL CO.*—M. L. Neuville, manager of market research and development.

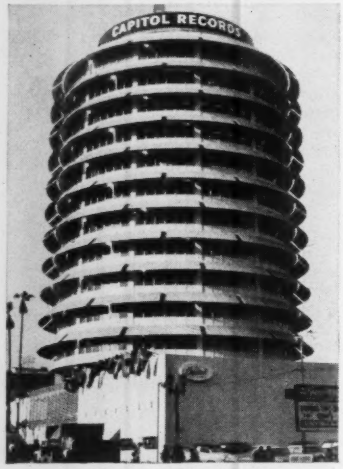
▶ *MUELLER CLIMATROL*—Lee A. Miles, assistant to field sales manager.

▶ *EMERSON ELECTRIC MFG. CO.*—George H. Childers, merchandise sales manager; Edward K. Handlan, manager of air conditioning sales.

▶ *AMERICAN ENGINEERING CO.*—Vernon A. Olson, sales manager of marine and hydraulics division; Fred R. Callowhill, sales manager of power plant division.

▶ *GOULDS PUMPS, INC.*—S. A. Bunis, assistant general sales manager.

▶ *DELAVAN MFG. CO.*—Leonard F. Janssen, project engineer in company's industrial and agricultural divisions.



CAPITOL RECORDS BLDG.
LOS ANGELES, CAL.

WELTON, BECKET & ASSOCIATES, ARCHITECTS-ENGINEERS, STATE PLUMBING & HEATING CO., MECHANICAL CONTRACTOR

Capitalize on

MILLER Streamflow CHECK VALVES

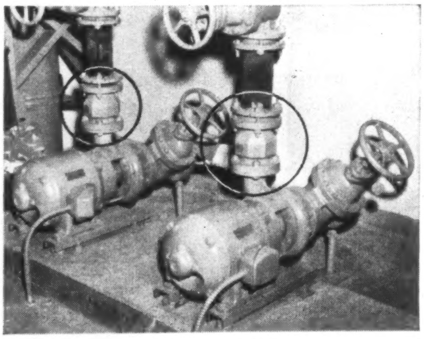
Completely Silences your piping system! CENTER-GUIDED, SHOCK PROOF, NOISELESS, ELIMINATES WATER HAMMER. FULL RADIAL FLOW.

SIZES 1" THROUGH 24".

FLANGED, ASA DRILLING, IBBM, CAST STEEL, ALL ALLOYS. FOR ALL FLUIDS AND GASES.

CERTIFIED MINIMUM PRESSURE DROP CURVE AVAILABLE

Visit our Booth 1118 International Amphitheater, Chicago, Illinois. International Exposition. February 25-March 1, 1957.



Write for literature • Agents in Principal Cities

MILLER VALVE CO., INC.

P.O. Box 1255—Pittsburgh 30, Pa. Plant—1620 Pennsylvania Ave.

HEAT-TIMER PRECISION CONTROLS

For many years HEAT-TIMER Corporation has provided the residential, commercial and industrial heating fields with the finest in heat regulating and combustion controls. Their high efficiency and dependability has won for them universal preference by engineers and contractors wherever they are distributed.

It will pay you to check the low cost and high quality of these products:

HEAT-TIMER®

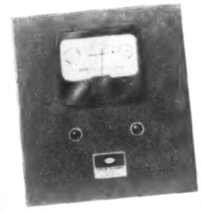
Electronic Weather Actuated Heating Control

Heat-Timer Electronic Weather Actuated Heating Control automatically regulates the amount of heat supplied to a building based on outdoor temperature and on the actual heat requirements of the building. In N. Y. City over 35,000 buildings save up to 40% in fuel costs using Heat-Timer controls.

Robot-Eye®

Electronic Combustion Control

Robot-Eye is the result of many years of research and development in the control of fuel-to-air ratio, to properly maintain optimum combustion and the elimination of smoke. It is used on all types of commercial and industrial burners using BunkerC or residual fuel oil . . . with savings ranging up to 15%.

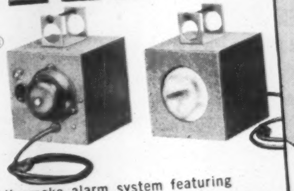


Smoke-Eye®

MODEL S INDICATING SMOKE ALARM

Designed to operate under the severe and exacting conditions of the boiler room. This low cost, efficient smoke alarm system meets all requirements of accuracy, dependability and long life.

Smoke-Eye®



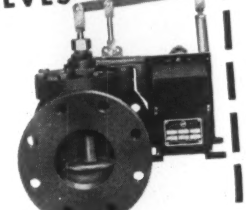
MODEL M SMOKE ALARM

A low cost, easy to install smoke alarm system featuring low installation cost and simplicity of operation. Its rugged construction and its dependability give it a quality unsurpassed by the most expensive smoke alarm systems.

MOTORIZED VALVES

For Zone Heating

Heat-Timer Motorized Valves provide the means for the control of the flow of steam or hot water. Can be actuated by any heating control, thermostat, aquastat, pressure switch, etc. Are obtainable in 30 second, 1 minute, 4 minute, and 6 minute timing.



VARIVALVE®

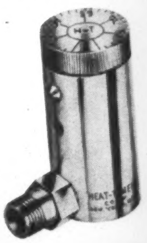
brings heat FAST to hard-to-heat radiators

With a venting orifice that is variable up to 5/16" diameter, the VARIVALVE is the fastest venting valve available. It is the only radiator air valve made using a bellows for power. This feature insures positive closing to steam, quiet operation — no hissing or clicking . . . and, extremely long life. Made of brass . . . chrome plated. Available in angle or straight shank.

HEAT-TIMER
VARIVALVE
QUICK VENT

MAIN LINE Quick-Vent Valve

A precision constructed valve with a rugged phosphor bronze bellows to insure dependable operation and long life. Venting orifice to ½" with provision for simple adjustment to meet venting requirements. Made of brass . . . chrome plated.



THERM-O-VALVE®

The Radiator Air Valve with the BUILT-IN THERMOSTAT

Control temperature room-by-room without interfering with existing controls operating the burner. Just select the temperature you desire on the dial . . . THERM-O-VALVE will do the rest . . . automatically. The room temperature will determine at the beginning of each heating cycle the venting rate, if any, of the air valve. The built-in bellows thermostat regulates the venting orifice of the THERM-O-VALVE. Available in straight or angle shank. Brass—chrome-plated.

SEE US IN CHICAGO

See actual demonstrations of these and other
HEAT-TIMER Precision Controls
at BOOTHS 336-338 — International
Heating and Air Conditioning Exposition

ALL HEAT-TIMER PRODUCTS
ARE UNCONDITIONALLY GUARANTEED

Write for complete catalog describing Heat-Timer Precision Controls

HEAT-TIMER CORPORATION

657 BROADWAY — NEW YORK 12, N. Y. — ALgonquin 4-5380

for your convenience **SPRAY NOZZLES** and all related accessories for **HUMIDIFYING** from a single, dependable source

PRECISION PNEUMATIC ATOMIZING NOZZLES

ACCESSORIES SUCH AS AIR FILTERS, HUMIDISTATS, SOLENOID VALVES, PRESSURE REGULATORS

COMPACT HUMIDIFYING UNITS

For industrial installations of every size Spraying Systems offers all needed equipment . . . everything but the piping, wiring and compressor. Provides high efficiency, dependable system; only two components have moving parts. Engineered for easy installation and simplified maintenance.

WRITE FOR Bulletin 82 . . . spray nozzles, assemblies and parts for manual or automatic humidifying systems.

ALSO SUPPLIED . . . spray nozzles for evaporative condensers, air washers, cooling towers, spray ponds and roof cooling systems.

SPRAYING SYSTEMS CO.
3219 RANDOLPH STREET • BELLWOOD, ILLINOIS
ADVANCED SPRAY NOZZLE DESIGN FOR NEW DIMENSIONS IN CONTROL AND PERFORMANCE

WHO'S WHAT

Continued

▶ *HAMMOND BRASS WORKS*—Morris R. Beschloss, advertising manager.

▶ *L. O. F GLASS FIBERS CO.*—Richard L. Loeffler, assistant manager, marketing research department.

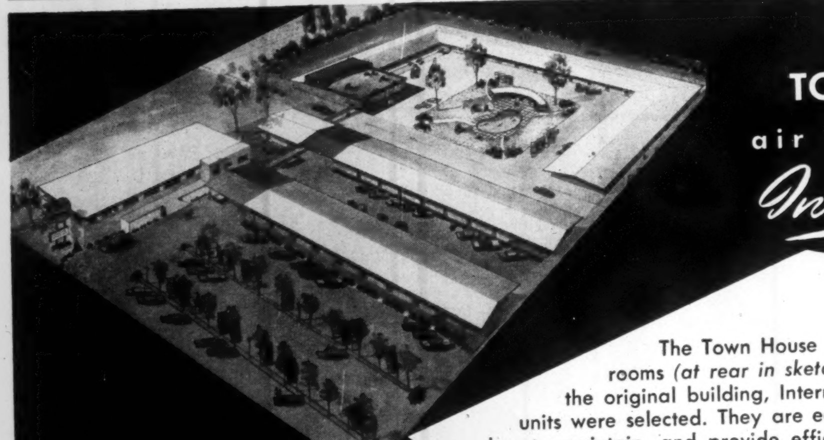
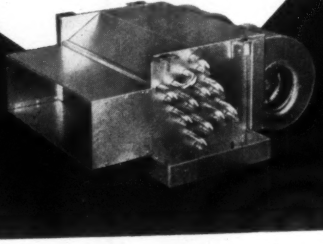
▶ *ARMSTRONG CORK CO.*—Clyde O. Hess, manager of public information.

▶ *RUBEROID CO.*—Alfred M. Eberle, assistant to general superintendent of company's plant in Dallas.

▶ *JOSEPH T. RYERSON & SON, INC.*—Frank E. Kolb, Chicago plant night superintendent; John F. Nadon, Detroit plant superintendent, succeeding Mr. Kolb.

▶ *PHILCO CORP.*—Harvey Williams, president of Philco International Corp.

▶ *HAYS CORP.*—Karl Ziegler, manager of sales promotion and advertising.

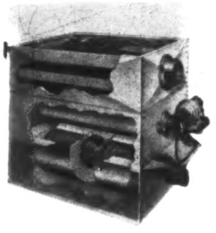


OMAHA'S TOWN HOUSE
air conditioned by
International

The Town House is expanding . . . 125 more rooms *(at rear in sketch)* . . . and again, as in the original building, International Ceiling Hideaway units were selected. They are easier to install, cost less to maintain, and provide efficient operation so pleasing to Town House guests. Whether you plan new construction or remodeling: write, wire or 'phone for the interesting "International story."

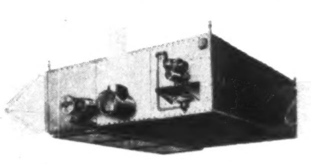
ONLY INTERNATIONAL OFFERS
- Whisper-quiet Operation
- All-aluminum Construction
- Elimination of Ductwork

INTERNATIONAL MANUFACTURING CO.
600 East Grand Avenue • Oklahoma City
Cable Address: "Intime"

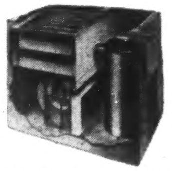
Specify CAMPBELL HEATERS FOR BIG WARM AIR JOBS



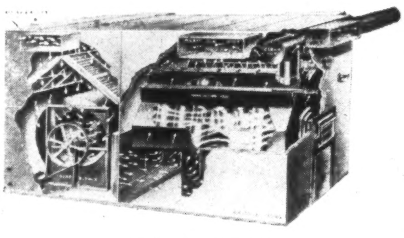
HI BOY UNIT HEATER



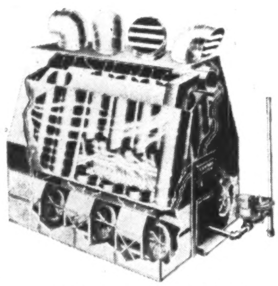
HORIZONTAL UNIT HEATER



LO-BOY HEATER



8000 SERIES HEATER



8000 SERIES UNIT HEATER

For easy installation, exceptional fuel economy and long, dependable service, specify Campbell. We will be glad to assist you on any large heating installation. Send us your preliminary plans and ideas and we will help you work them out.

SPECIFICATIONS and DIMENSIONS

HEATER				BLOWER‡			MAX. FUEL RATE§				DIMENSIONS		
Unit No. *	Output Capacity BTU/Hr. †	Heating Surface Sq Ft	Btu per Sq Ft Heating Surface	Normal cfm 135° Dischg. Temp.	Assumed External Static In. Water	Motor hp	Oil gph	1000 Btu Gas cfh	LP Gas gph	Coal Lbs Per Hr.	H in.	L in.	W in.
Hi Boy & Horizontal Unit Heater—Oil & Gas for Churches, Schools, Commercial & Industrial Buildings													
U225	225,000	83	2700	2750	½	½	2.0	280	2.8		66	48	23
U275	275,000	83	3300	3300	½	¾	2.5	350	3.5		66	48	23
U325	325,000	119	2700	4000	½	¾	2.9	400	4.0		72	54	29
U400	400,000	119	3300	4900	½	1	3.6	500	5.0		72	54	29
U500	500,000	180	2800	6100	½	1	4.5	625	6.3		84	60	34
U600	600,000	180	3300	7300	½	1½	5.4	750	7.5		84	60	34
U700	700,000	244	2850	8500	½	2	6.2	875	8.8		99	78	40
U800	800,000	244	3300	9800	½	2	7.2	1000	10.0		99	78	40
U950	950,000	333	2850	11,600	½	3	8.5	1200	12.0		108	96	48
U1100	1,100,000	333	3300	13,500	½	3	9.8	1375	13.8		108	96	48
Lo Boy Oil & Gas Fired for Large Residences, Small Churches, Schools, etc.													
H200	235,000	100	2350	2600	½	½	2.2	293	2.9		52	75	41
H250	275,000	125	2200	3300	½	¾	2.5	344	3.4		57	85	41
H300	340,000	136	2500	4000	½	¾	3.2	425	4.2		61	87	50
H350	400,000	152	2600	4600	½	1	4.0	500	5.0		61	87	50
H400	450,000	167	2700	5300	½	1½	4.5	560	5.6		61	87	50
H500	500,000	200	2750	6600	½	1½	5.5	625	6.2		74	91	60
H600	650,000	240	2700	8000	½	2	6.5	810	8.1		76	97	60
H700	750,000	280	2700	9200	½	2	7.5	940	9.4		72	104	80
8000 Series Oil, Gas, Stoker or Hand Fired For Large Schools, Churches, etc.													
8075	840,000	280	3000	11,000	¾	3	7.5	1050	10.5	100	93	134	76
8100	960,000	320	3000	12,500	¾	3	8.6	1200	12.0	114	95	153	76
8125	1,080,000	360	3000	14,100	¾	3	9.7	1350	13.5	129	97	171	76
8150	1,320,000	440	3000	17,300	¾	5	11.8	1650	16.5	157	98	195	76
8175	1,440,000	480	3000	18,900	¾	5	12.9	1800	18.0	171	99	202	76
8200	1,800,000	600	3000	23,600	¾	5	16.1	2250	22.5	214	120	216	94
8250	2,250,000	750	3000	29,500	¾	7½	20.1	2810	28.0	268	120	243	94
8300	2,700,000	900	3000	35,400	¾	7½	24.1	3380	33.8	320	132	251	104
8350	3,150,000	1050	3000	41,300	¾	10	26.1	3940	39.4	375	150	251	114
8000 Series Unit Heater—Oil, Gas, Stoker or Hand Fired—For Large Industrial Buildings													
U8125	1,080,000	360	3000	14,100	Consult our Engineers if duct system is to be used.	2-1	9.7	1350	13.5	129	97	105	76
U8150	1,320,000	440	3000	17,300		2-1½	11.8	1650	16.5	157	98	118	76
U8175	1,440,000	480	3000	18,900		2-1½	12.9	1800	18.0	171	99	130	76
U8200	1,800,000	600	3000	23,600		2-2	16.1	2250	22.5	214	120	137	94
U8250	2,250,000	750	3000	29,500		2-3	20.1	2800	28.0	268	120	157	94
U8300	2,700,000	900	3000	35,400		2-3	24.1	3380	33.8	320	132	157	104
U8350	3,150,000	1050	3000	41,300		2-5	26.1	3940	39.4	375	150	157	144

* Type A units include Special Oil or Gas Heater, Casing, Blower, Motor, Drive, Filters, Humidifier, and Blower Control but less Burner, Controls and Built-in Combustion Chamber.
Type B units include same as Type A plus Oil or Gas Burner and built-in Combustion Chamber and Standard Controls.

† Based on 80% thermal efficiency for oil and gas and 70% for coal. Add 10% to 35% over calculated heat loss for pick-up load and 10% to 15% for duct radiation losses. The higher figure is preferable for best operating economy and life of the equipment.

‡ For other air volumes and static pressures consult our Engineering Department.

§ An induced draft blower can be furnished if a stack or chimney is not available. The gas passages of the heaters are adequate so an inducted draft blower is not ordinarily needed.

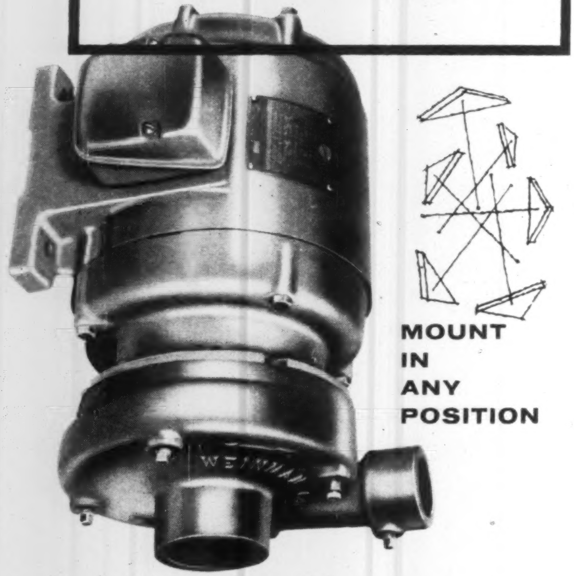
For Complete Specifications, See *Sweet's Catalog Service*

CAMPBELL HEATING COMPANY

Des Moines 17, Iowa

BIGGER
NEWER

WEINMAN
AC UNIPUMPS



A real space saver, WEINMAN Close-Coupled Type AC Centrifugal Pumps can be mounted in any desired position . . . on the floor, the ceiling or on a wall . . . with the shaft horizontal, vertical or at an angle. A rotary type mechanical shaft seal, a ceramic floating seal seat and a carbon compound sealing washer assure longer life and leakless operation in any mounted position, even when handling water containing abrasive dust such as may be collected when water passes over a cooling tower.

No matter how specialized your need for a circulating pump, you'll find the pump you need in WEINMAN'S bigger line of AC pumps. The recent addition of the new 6 AC and 8 AC models to the standard WEINMAN AC Line make this popular unit available with higher capacities, a wider choice of larger motors, and a greater variety of sizes than ever before.

WEINMAN Type AC Centrifugal Pumps are preferred by engineers the nation over for air conditioning systems, cooling tower circulation, hot and chilled water circulation, booster service and other general pumping needs. Write for free literature.

If you have an immediate pump problem, call your nearest WEINMAN CENTRIFUGAL PUMP SPECIALIST. He's listed in the yellow pages of your phone book.

THE WEINMAN PUMP MFG. CO.
290 SPRUCE ST. COLUMBUS 8, OHIO

WHO'S WHAT

Continued

▶ *BARNES MFG. CO.*—Charles H. MacQuigg, water systems sales supervisor.

▶ *SIMPSON ELECTRIC CO.*—William R. Johansen, assistant sales manager.

▶ *CULLIGAN, INC.*—Frederick M. Bouskill, director of retail division.

▶ *AMERICAN STANDARDS ASSOCIATION*—Kenneth G. Ellsworth, director of public relations.

IN THE TERRITORIES . . .

(Recent sales appointments)

▶ *KENNEDY VALVE MFG. CO.*—Jack L. Skinner, West Coast branch manager.

▶ *PENNSYLVANIA SALT MFG. CO.*—Charles K. Kaiser, agent for eastern and upper Michigan.

▶ *A. W. CASH CO.*—Ken Weeks and Bob Lefley, in charge of new Chicago sales office. Appointed representatives are: E. C. Cooley Co., San Francisco, northern California; Gay Sales Co. Assoc., southeast Texas; Lytle Engineering Specialties, Ltd., Montreal; McGinnis-Hill Co., east Tennessee, southeast Kentucky; Noel Moffitt Co., Ltd., Ontario; North-Monsen Co., Utah, northeast Nevada; Richard S. Dawson Co., southern California, southwest Nevada; Arduser and Co., Tulsa; T. R. Christy Co., Milwaukee.

▶ *PEERLESS ELECTRIC CO.*—Karl Sweikardt, factory sales representative in New Mexico.

▶ *TUTHILL PUMP CO.*—Atlas Equipment Co., representative for Washington, Oregon, Montana, Idaho, Alaska.

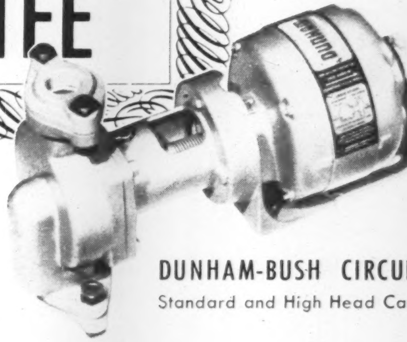
▶ *U.S. AIR CONDITIONING CORP.*—Leonard Gordon, regional sales manager of new Minneapolis office. His territory comprises Minnesota, the Dakotas, Nebraska, parts of Wisconsin and Iowa.

▶ *LUNKENHEIMER CO.*—Jack L. Green, Houston sales representative.

▶ *AIRTEMP DIV., CHRYSLER CORP.*—Harry Alter Co., Inc., Chicago area distributor; St. Petersburg Fuel Oil & Heating Co., franchised dealer for air conditioning line in St. Petersburg, Fla.

another DUNHAM-BUSH PROFIT POINTER

LIFETIME COUPLING GUARANTEE



DUNHAM-BUSH CIRCULATOR
Standard and High Head Capacities

forget about stocking or replacing circulator couplings

Anyway you figure it, you're money ahead with Dunham-Bush Circulators.

The single spring Coupling in every Dunham-Bush Circulator is *guaranteed* for the lifetime of the Circulator. No "ifs", "ands" or "buts"—you just plain don't stock replacement couplings . . . don't have costly replacement "call backs". And that means more profit!

Circulator installation is quick and easy either in horizontal or vertical pipes . . . in supply mains or return lines . . . with six positions to fit any application.

And look at these additional profit-performance "proofs":

- *Vibration-proof* one-piece impeller
- *Water-proof* bearing lubrication section
- *Overload-proof* brand name motor

Insure your profit with these guarantees. Get details of the complete Dunham-Bush hot water line, now.

DEPEND ON

DUNHAM-BUSH ONE SOURCE RESPONSIBILITY

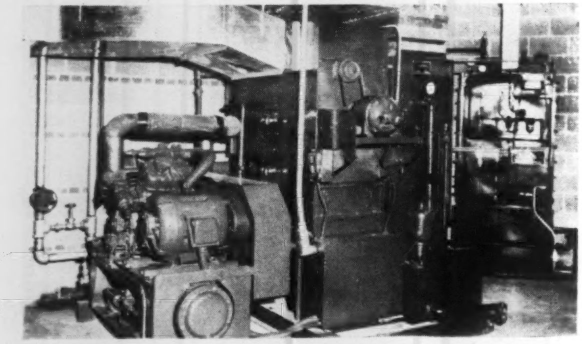
Air Conditioning, Refrigeration, Heating Products and Accessories

DUNHAM-BUSH, Inc. West Hartford 10, Conn., U.S.A.

MARSHALLTOWN, IOWA • MICHIGAN CITY, INDIANA • RIVERSIDE, CALIFORNIA •
TORONTO, CANADA • LONDON, ENGLAND • SUBSIDIARY: HEAT-X, INC., BREWSTER, N.Y.

DUNHAM-BUSH, INC. Dept. HP
West Hartford 10, Conn.
Rush me Circulator and hot water equipment profit details (Bulletin 1551)
Name
Company
Street
City Zone State

DRY AIR...
PRECISELY as you want it



NIAGARA CONTROLLED HUMIDITY AIR CONDITIONING

This method removes moisture from air by contact with a liquid in a small spray chamber. The liquid spray contact temperature and the absorbent concentration, factors that are easily and positively controlled, determine exactly the amount of moisture remaining in the leaving air. Heating or cooling is done as a separate function.

The Niagara's Controlled Humidity Method using HYGROL moisture-absorbent liquid is

Best and most effective because . . . it removes moisture as a separate function from cooling or heating and so gives a precise result constantly and always. Niagara machines using liquid contact means of drying air have given over 20 years of service.

Most reliable because . . . the absorbent is continuously reconcentrated automatically. No moisture-sensitive instruments are required to control your conditions.

Most flexible because . . . you can obtain any condition at will and hold it as long as you wish in either continuous production, testing or storage.

Easiest to take care of because . . . the apparatus is simple, parts are accessible, controls are trustworthy.

Most compact, taking less space for installation.

Inexpensive to operate because . . . no re-heat is needed to obtain the relative humidity you wish in normal temperature ranges and frequently no refrigeration is used to remove moisture.

The cleanest because . . . no solids, salts or solutions of solids are used and there are no corrosive or reactive substances.

Write for full information; ask for Bulletins 112 and 121. Address Dept. HP

NIAGARA BLOWER COMPANY
405 Lexington Ave., New York 17, N. Y.
District Engineers in Principal Cities of U.S. and Canada

WHO'S WHAT

Continued

▶ *JOHNSON SERVICE CO.*—In charge of newly established branch offices are: James R. Gaylor, Savannah, Ga.; R. C. Spangenberger, Ft. Worth, Tex.; Charles W. Browne, Duluth, Minn.; Charles F. Hoscheid, Jr., Moline, Ill. Other appointments include: James W. Taylor, engineer in charge of Memphis branch; Robert C. Wang, assigned to engineering staff of San Francisco branch.

▶ *TRANE CO.*—Elliot Ehrman, to specialize in handling company's packaged air conditioning lines, working directly with dealer and distributor accounts in New York area.

▶ *BLACK & DECKER MFG. CO.*—Rovan A. Wernsdorfer, northeastern regional service manager.

▶ *CONNOR ENGINEERING CO.*—Don Allbert, associate in Norris Blanchard Co., Inc., representing Connor Engineering in Omaha.

▶ *WOLVERINE TUBE, DIV. OF CALUMET & HECLA, INC.*—C. A. Johnson, representative in Detroit area.

▶ *WESTINGHOUSE ELECTRIC CORP.*—Carl LaGasse, sales manager, heating and air conditioning department, for Westinghouse Electric Supply Co. in Arizona.

▶ *GUSTIN-BACON MFG. CO.*—Keystone Div., Dravo Corp., regional distributor for glass fiber insulation products in western Pennsylvania, parts of West Virginia, Ohio, Maryland.

▶ *YORK CORP.*—George C. Briley, manager of Rochester, N.Y., office; Paul L. Sackett, Boston area branch manager for industrial division.

▶ *VILTER MFG. CO.*—George E. Brenton, district manager of new Houston sales office.

▶ *CARRIER CORP.*—Richard Bell, named administrative assistant to president of Air Conditioning Co., Inc., Glendale, Calif., distributor and installer for Carrier.

▶ *ORR & SEMBOWER, INC.*—New sales representatives and their territories are: C. R. Hutcheon, Inc., northern New Jersey; Harry Hoyle Contracting Co.,

HOW TO CUT APPLICATION COSTS

in Protecting Pipe and Pipe Joints Against Corrosion

Let

TAPECOAT®

do the job without Kettles, Hot Stuff, or Special Crews

When specifications call for hot applied coal tar protection of underground piping as in AWWA specifications C-203 and C-204, and the volume does not justify the cost of shipment to a mill for coating—TAPECOAT offers a practical solution. Here is a widely-accepted alternate material that is equivalent to mill-applied hot coal tar protection.

With this coal tar coating in handy tape form, piping contractors can use their own personnel to do the job because technical know-how and special equipment are not required. You save time and money and eliminate the need for sub-contracting in assuring the long-life protection called for.

TAPECOAT is easy to apply, using a torch to soften and bleed the pitch which provides both bond and protection. Available in widths of 2″, 3″, 4″, 6″, 18″ and 24″, it is spirally wrapped or cigarette wrapped around the vulnerable surfaces.

Since 1941, TAPECOAT has proved its ability to fight corrosion on pipe, pipe joints, mechanical couplings, conduit, cable and insulated piping.

Write for illustrated brochure.

The TAPECOAT® Company

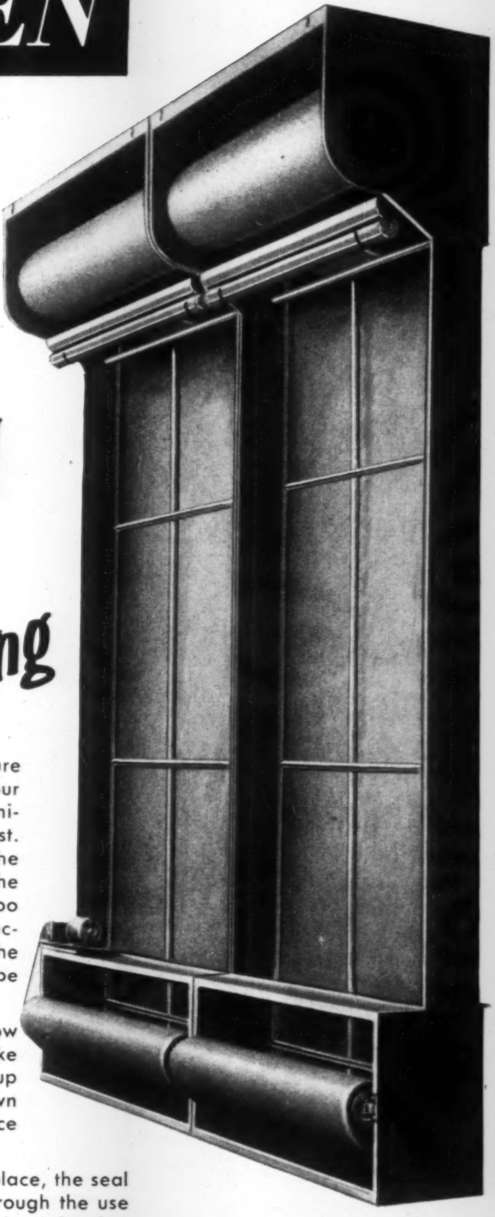
Originators of Coal Tar Coating in Tape Form

1555 Lyons Street
Evanston, Illinois

GREEN

Sure-Seal AIR FILTER

Fully Sealed while Indexing



Visualize, if you will, this Sure Seal Filter operating in your plant to rid incoming contaminated air of all dirt and dust. Being a very effective filter, the point will be reached when the filtering medium becomes too clogged to permit a satisfactory flow of air. The dirtier the air the sooner this point will be reached.

The filtering medium will now automatically change. The take up roll at the bottom will roll up the dirty medium, pulling down a fresh, clean section into place from the top roll.

While this change is taking place, the seal at the sides remains tight through the use of an ingenious counter-weighted floating tubular seal. Contaminated air cannot flow into the room around the edges when the medium is being changed.

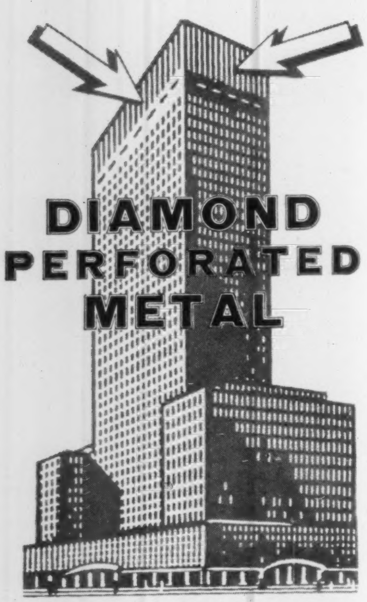
Two methods are available for automatically changing or "indexing" the filtering medium: by pressure differential control (as would be the case outlined above) or by timed cycles.

The Green Sure Seal Air Filter is *surely* sealed, at all times. If you would be interested in all the details, send for our Bulletin #175. We would appreciate it if you would accompany your request with an outline of your problem. This unit comes in many sizes . . . from 12 to 370 square feet of filter area and up to 187,000 cfm in capacity.

THE GREEN FUEL ECONOMIZER CO.

BEACON • NEW YORK

Representatives in Principal Cities



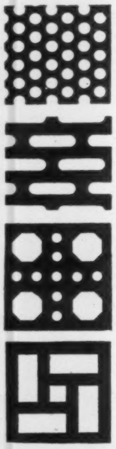
DIAMOND PERFORATED METAL

for Socony Mobil's Modern Air Conditioning Installation

New York City's newest, largest and finest metal clad office building, sheathed with more than 400,000 sq. ft. of patterned stainless steel, is also the largest commercial structure to be, initially, completely air conditioned. On the top three floors, devoted entirely to air conditioning and other mechanical equipment, the wall panels are perforated to permit free passage of air at low velocity.

It was our privilege to perforate the more than 40,000 sq. ft. of stainless steel sheet required for that purpose—under a sub-contract and in accordance with the specifications of the engineers who designed the very modern air conditioning system.

We appreciated, very highly, the opportunity to participate in such an outstanding achievement but are equally interested in any other requirement for perforated metal—no matter how large or small—and have hundreds of specialized tool arrangements which assure prompt accurate service. Catalog 39 contains complete working data and shows many interesting applications, in its 32 large illustrated pages.



DIAMOND MANUFACTURING CO.
Box 34 WYOMING PENNA.
(Wilkes-Barre Area)

West Coast Plant, Diamond Perforated Metals Co.
17915 So. Figueroa St., Gardena, California
Los Angeles Area

WHO'S WHAT *Continued*

Rockland County, N. Y.; Allen Bullard Co., central Arkansas.

▶ *E. I. du PONT de NEMOURS & CO., INC.*—Robert Wright, Jr., technical sales representative for "Kinetic" Chemicals Div. in St. Louis area.

▶ *KRITZER RADIANT COILS, INC.*—Patrick Savage, representative for greater New York metropolitan area.

▶ *FIELD CONTROL DIV.*—Oliphant Commercial Corp., agent for company's draft control line in northern California.

▶ *ALLIS-CHALMERS MFG. CO.*—Ralph L. Haney, manager of newly opened Industries Group branch office at Allentown, Pa.

▶ *ANSUL CHEMICAL CO.*—Assigned refrigeration managers are: Rex Whitlow, northern North Carolina, Virginia, Maryland, Delaware; William Miller, New York City; John Gregory, New York State, New England; T. R. Kearney, New Jersey, eastern Pennsylvania.

▶ *ACRO MFG. CO.*—Eric Denman, Canadian representative. He will headquarter at Toronto.

▶ *OLIN MATHIESON CHEMICAL CORP.*—Cameron & Barkley Co., distributor for "Ramset" powder actuated fastening tools and "Shure-Set" hammer-in fastening tool in the Southeast.

▶ *FEDDERS-QUIGAN CORP.*—New distributors and their territories are: Hart-Greer, Inc., Birmingham and Mobile, Ala.; Joe L. Pleasants, Inc., Charlotte, N.C.,; Copeland & Co., Knoxville and Bristol, Tenn.

RECOLD

Air Conditioning

The *"RECOLD"* line of air handling equipment is the culmination of over a quarter century's experience in air conditioning and refrigeration engineering. Each piece of equipment, from the tiny half-ton room air conditioner to the largest 35,000 CFM air handler, is designed, rated and manufactured to the highest engineering standards.

A quality product with superior performance never comes as an accident! *"RECOLD"* quality results from the combination of: careful design, skilled manufacture, honest ratings, and irreproachable engineering. *"RECOLD"* also manufactures a complete line of commercial and industrial refrigeration equipment.

Write for complete information on "RECOLD" products and the name of your nearest distributor.

RECOLD
SINCE 1932

REFRIGERATION ENGINEERING, INC.
7250 E. Slauson Ave., Los Angeles 22, Calif.
Phone: RAymond 3-3281

DAVIS

VALVE SPECIALTIES FOR STEAM, AIR OR GAS

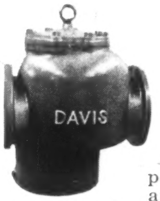
Davis offers a complete line of valve specialties including relief valves, altitude valves, pump governors, pressure regulators and emergency valves. No matter what the control problem, there's a Davis specialty product to meet the need. Contact Davis today for precision control valves.

RUGGED, DEPENDABLE STRAINERS FOR AIR-CONDITIONING SYSTEMS

Davis builds a high quality line of strainers that are ideal for installing in today's modern commercial air conditioning systems. They are easy to service and are available in a wide range of sizes. Three of the most widely used are shown below:

No. 75 "Y" TYPE

Bolted cap "Y" Type Strainer for easy access for cleaning. Blowoff at lowest point—no sediment pocket! Complete range of sizes: 3/8" to 14"... available in semi-steel, bronze or steel bodies, screwed or flanged. Brass, stainless or monel screens. For steam, air, gas or fluids . . . pressures to 1500 psi.



No. 76 BASKET TYPE

The No. 76 Strainer has a cylindrical basket with perforated sides and bottom — easily lifted out for cleaning. Large body passage for low pressure drop. Sizes 1/2" to 24"... bronze, semi-steel or steel bodies . . . brass, stainless, monel steel baskets . . . special meshes available. Ask for recommendations.

No. 77 BASKET TYPE

Similar to No. 76 except for applications where lowest possible pressure drop is desired.

WRITE FOR BULLETIN 800

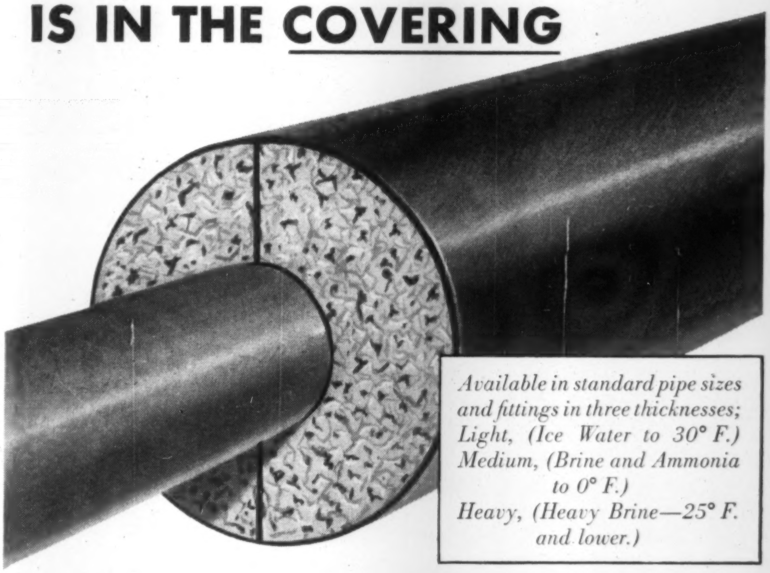
Davis

DAVIS REGULATOR COMPANY

2541 So. Washtenaw • Chicago 8, Illinois

The heart of the matter

IS IN THE COVERING



Available in standard pipe sizes and fittings in three thicknesses;
Light, (Ice Water to 30° F.)
Medium, (Brine and Ammonia to 0° F.)
Heavy, (Heavy Brine—25° F. and lower.)

UNITED CORK PIPE COVERING

THE IDEAL COLD LINE INSULATOR

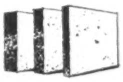
Improper pipe insulation can mean an excessive loss in refrigeration efficiency and dollars to the cold storage operator. It is important to get the right pipe covering insulation that will have all these advantages:

- Extremely low "K" factor
- Retains over 80% of cold loss on piping
- Easy and economical to install
- Long trouble-free life
- Fire retardant—Vermin resistant
- No capillarity

LARGER STOCKS—FASTER DELIVERY—PERSONAL SERVICE

United Pipe Coverings are available from stock for prompt delivery—to fulfill your immediate installation requirements. Mail the coupon below for additional information or the United distributor nearest you.

Corkboard



Pipe Covering

Tank Lagging

UNITED BB CORKBOARD (BLOCK BAKED) Patented

Manufacturers of cork insulation for almost a half century

UNITED CORK COMPANIES

1 Central Ave., Kearny, New Jersey

UNITED CORK COMPANIES, 1 Central Ave., Kearny, N.J.

Please send United Cork Catalog. I am interested in

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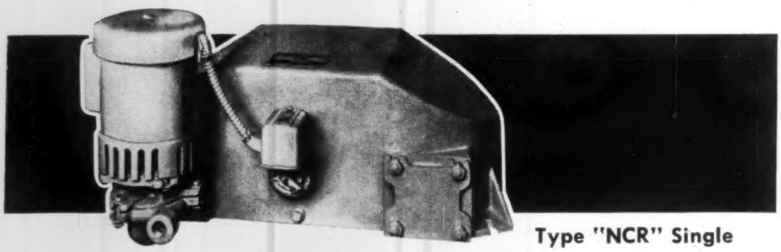
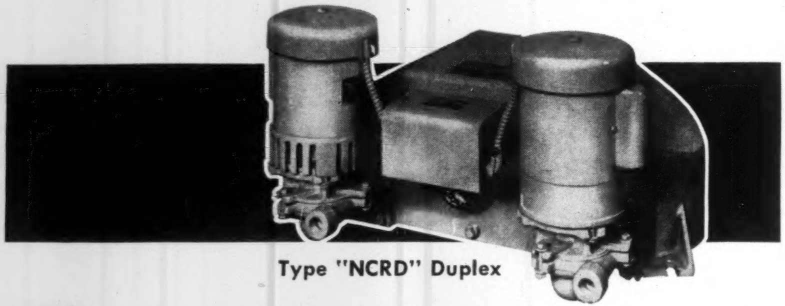
CITY ____________ ZONE ______ STATE ______

Engineering offices, or approved distributors, in key cities—coast to coast.



Type "NCR" Single



Type "NCRD" Duplex

7 Important Advantages in WHEELER-ECONOMY Condensate Return Pumps

For ratings up to 8,000 Sq. Ft. E.D.R. at 50 psi

1. Close-Coupled Pump with Mechanical Seal • Pump flanged directly to receiver • Water flows from tank to pump without passing through any piping.
2. Low Inlet • Only 7½" above floor • Simplifies installation • Keeps piping out of way.
3. Single Unit can be converted to Duplex Unit • Simply remove blind flange and add a pump, motor and mechanical alternator.
4. Float Control features External Adjustment for limiting operational levels of condensate within receiver.
5. Single Unit is operated by a float switch. Duplex Unit features a mechanical alternator which alternates operation of pumps, provides emergency operation of one pump should the other be inoperable and simultaneous operation of both pumps under peak flow conditions.
6. Easily Serviced • Can be taken apart quickly without disturbing pipe connections.
7. Self-Venting • Oversize Suction inlet permits pump to handle condensate at 200° F without vapor locking.

40 YEARS REPUTATION

Today's Wheeler-Economy Heating System Pumps are backed by 40 years of high performance in thousands of installations.

Write for Catalog H-1.

C. H. WHEELER MANUFACTURING CO., ECONOMY PUMP DIVISION
19th & Lehigh, Philadelphia 32, Pa.

WE 700

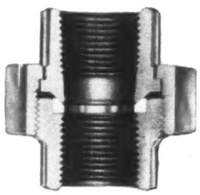
C. H. Wheeler
OF PHILADELPHIA

"In this Union there is strength"

...it's CAPITOL 300# forged steel UNION!

Continual testing and inspection assure water-tight seat, close tolerance and accurate threads.

- Brass or integral steel seat
- Sizes 1" through 2" ALL forged steel
- Smaller sizes machined from solid bar
- Close tolerance
- Meets all Federal Specifications



the U.L. label guarantees quality

the packaging assures profits!

Available from stock in sizes ½" through 2", 300# steam or 2000# cold water, oil or gas, non-shock.

Order all your fittings from

CAPITOL
MFG. & SUPPLY CO.
COLUMBUS, OHIO

COUPLINGS — NIPPLES — UNIONS — BUSHINGS — PLUGS — REDUCERS — CAPS—CAPADAPTERS—WELL SUPPLIES

WHO'S WHAT

Continued

▶ *AMANA REFRIGERATION, INC.*—Eldon H. Adrian, sales manager of St. Louis region, which is comprised of most of Missouri and Tennessee, western Kentucky.

▶ *HUCK MFG. CO.*—Allen R. Tenny and William Messer, eastern and midwest division sales managers, respectively; Robert B. Brackeen, sales engineer covering Texas, Oklahoma, Arkansas, Mississippi, Louisiana.

▶ *MANNING, MAXWELL & MOORE*—Walter A. White, sales engineer in Chicago district for industrial controls division.

▶ *PATROL VALVE CO.*—Harvey M. Olmstead Co., representative for Colorado, Utah, eastern Nevada, western Nebraska.

▶ *VANTON PUMP & EQUIPMENT CORP.*—E. H. Bigden, head of newly opened sales office in St. Louis, to cover eastern Missouri, parts of southern Illinois.

▶ *HEAT-TIMER CORP.*—Enterprise Heat & Power Co., midwestern distributor for company's new heat recorder-totalizer unit.

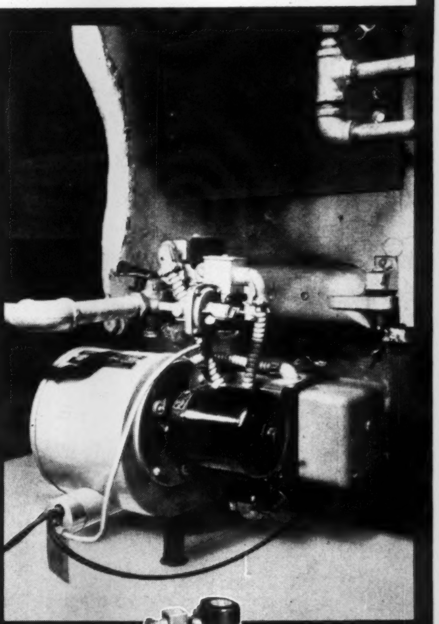
▶ *BRYANT MFG. CO.*—Frank N. Seaver, head of Bryant of Wisconsin, Inc., the company's newly formed distributor for Wisconsin. The operation will be located in Milwaukee.

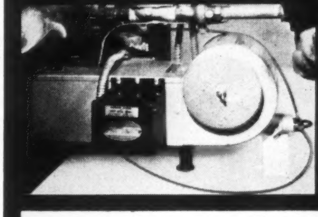
▶ *ALLEGHENY LUDLUM STEEL CORP.*—Harvey B. Lucas and John H. Snedeker, assigned to Seattle district sales office to represent the company in northwest coast area.

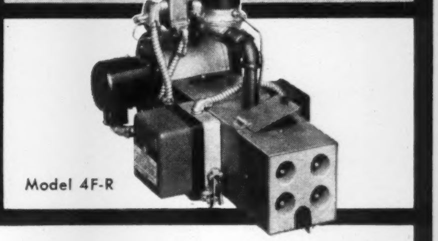
Choose Mettler FAN-AIR "small conversion" Gas Burner for volume water heating

with these standout features:

- Burns all gases at low pressures in any heat exchanger, with all combustion air from a low speed fan, or limited operation with natural draft.
- Has exclusive Mettler spark-ignited, rectifier safety pilot and dependable full-flame safety protection.
- Capacity range easily adjustable from 100,000 to 600,000 Btu.







Model 4F-R

● This Mettler "Model 4F-R" Gas Burner . . . recently installed for volume water heating in a large Santa Barbara estate . . . offers many stand-out features for conversion of small boilers and furnaces. For, its replaceable jets permit easy, low-cost adjustment of input within an extremely wide range. Highest possible efficiency is achieved, too, because gas and air are thoroughly mixed by converging streams in each of the four burner ports. It's a quiet, clean-firing unit, and gives you *uniform* heat distribution impossible to match with any other burner. So, if you're looking for a low-cost conversion burner with *big-burner quality* . . . a packaged unit, complete with all controls for fully automatic firing and highest safety factor . . . *specify* Mettler's Model 4F-R, FAN-AIR! Write for Bulletin G-100.

METTLER

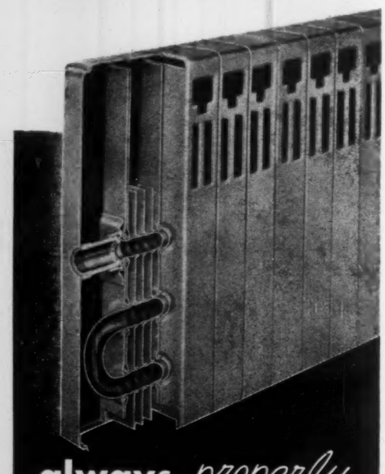
Eclipse

THE METTLER CO., INC.
Division of ECLIPSE FUEL ENGINEERING CO.
4366 Worth Street, Los Angeles 63, California

2 kinds of heat

RADIANT and CONVECTED

from SHAW RADIATORS



always *properly* distributed in the room!

Shaw Radiators "heat-condition" a room for *natural* comfort by delivering *radiant* heat that warms solid objects, and *convected* heat to warm the atmosphere.

This AIR-e-ATED Radiant Heat, exclusively Shaw's, is distributed in unvarying, health-guarding proportions that only Nature—*at her best*—can rival.

AIR-e-ATED Radiant Heat is the result of Shaw's fully self-contained construction, featuring full length steel heating fins and exterior radiant panels *all tightly bonded to the copper heating coils.* Shaw units—panel or baseboard—are but 3" thick, easily handled and installed. Choice of same end or opposite end tapping permits simplified piping, lower piping costs. Hot water or steam may be used up to 150 psi.

Write today for free literature

SP-17

SHAW-PERKINS MFG. CO.

201 EAST CARSON ST., PITTSBURGH 19, PA.

WHO'S WHAT

Continued

▶ *McINTIRE CO.*—Charles L. Wachholtz, representative for Texas, Oklahoma, Arkansas, New Mexico, western Louisiana. He will headquarter in Dallas.

▶ *PARKER APPLIANCE CO.*—Warner Co., distributor for tube and hose fittings and tube working tools in Colorado.

▶ *TYPHOON AIR CONDITIONING CO., INC., DIV. OF HUPP CORP.*—Gordon Shewman, district manager in southern Illinois, Missouri, Oklahoma, Kansas.

▶ *WARNER ELECTRIC BRAKE & CLUTCH CO.*—Reginald Kennard, field sales representative for industrial division in Washington, D.C., area.

▶ *NATIONAL SUPPLY CO.*—C. Kirk Garrett, district manager at Atlanta office of Spang-Chalfant Div.

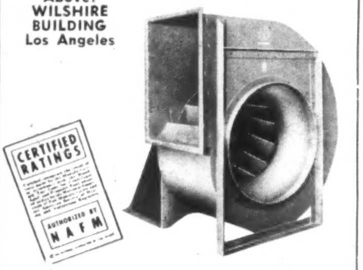
▶ *WHIRLPOOL-SEEGER CORP.*—Richard Powell, general manager of Clyde, Ohio, division.

▶ *JOSEPH T. RYERSON & SON, INC.*—John Rudy, office and credit manager for Pittsburgh steel service plant.

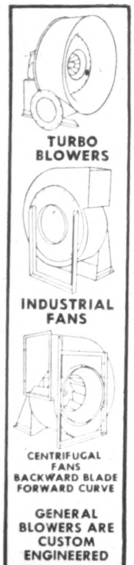
help your heart fund
help your heart

Air Requirements BY GENERAL

Above: WILSHIRE BUILDING Los Angeles



BACKWARD BLADE NON-OVERLOADING CENTRIFUGAL FAN


TURBO BLOWERS
INDUSTRIAL FANS
CENTRIFUGAL FANS BACKWARD BLADE FORWARD CURVE

GENERAL BLOWERS ARE CUSTOM ENGINEERED

GB

Thirteen stories of handsome, wall curtain construction, the beautiful Wilshire Building is fully air conditioned using eight General Blower centrifugal, backward blade fans. These units deliver a total of 200,000 CFM. They operate quietly, efficiently, are non-overloading. GB can supply all air requirements for heating, ventilating and air conditioning. Call the GB rep in your area or write direct.

There's a GB blower for every purpose. Backward blade, forward curve centrifugal fans — Util-A-Vent sets — Propeller fans — Fume exhausters — Turbo blowers — Gas boosters — Industrial fans.

Send for free information.

AMERICA BREATHES EASIER WITH "Lungs for Industry"

Over 20 years of engineering and manufacturing experience

GENERAL BLOWER COMPANY

8601 FERRIS AVE., MORTON GROVE, ILL.

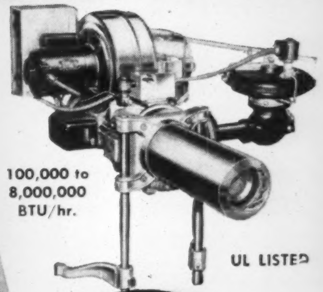
THE NEXT MEDICAL MILESTONE

. . . CONQUEST OF CANCER?

In a few short years we've seen the discovery of antibiotics, new wonder drugs for tuberculosis, a vaccine for polio. We will see the conquest of cancer, too, if people want it badly enough. Last year the American Cancer Society was unable to fill requests for research funds totalling almost $3,000,000. The reason—not enough money. Did you give all you could? Will you give all you can?

AMERICAN CANCER SOCIETY

DIFFERENT?
SUPERIOR?
CERTAINLY!



GAS
syncro flame
GAS

NEW POWER GAS BURNER FILLS IMPORTANT NEEDS

Be *sure* you know about SYNCRO/FLAME whenever you have a job that calls for a good forced-draft gas burner! This one is designed for boilers in the range of 10 to 150 h.p. It comes in seven sizes, of different capacities, and it is outstanding for unusual and valuable features. Among them are . . .

NON-PULSATING FLAME
EXPLOSION-FREE CIRCUIT

Adept engineering has achieved a flame that positively does *not pulsate* on starting or stopping, thus completely removing a common objection. Also, a new control circuit virtually eliminates *any* chance of explosion, even under conditions of bad misadjustment. Circuits are also provided for pre-purge, post-purge, and graduated light-off. *Certainly*—a *great* power gas burner!

WRITE FOR LITERATURE

Write today for circular describing all features and giving full specifications. Ask for Bulletin 553.

MANUFACTURERS OF OIL AND GAS AND OIL/GAS BURNERS
SYNCHRONOUS FLAME, INC.
WALWORTH • WISCONSIN

For Low-Cost Heating Plant Exhausting and Industrial Venting ...Investigate

Quickdraft

Capacities of 56 standard and heavy duty models (6 to 30-inches diameter) . . . 140 CFM to 16,766 CFM with or without stacks. Greater capacities on special order.

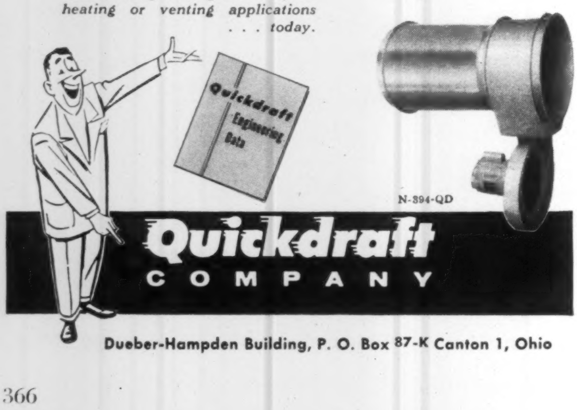
★ NEW ACID-RESISTING FINISHES
★ NO FAN OBSTRUCTION IN EXHAUST LINE
★ BLOWER OPERATES IN CLEAN OR OUTSIDE AIR
★ CAN BE USED WITH OR WITHOUT STACK

FOR HEATING PLANTS AND INCINERATORS. Quickdraft provides constant draft required for efficient and economical combustion. It prevents noxious concentrations of deadly fumes and dangerous accumulations of explosive gases from escaping into buildings. It eliminates pulsating or chattering, puffing, smoking and sooting. Quickdraft's acid-resisting vitreous enamel finish assures trouble-free performance.

FOR INDUSTRIAL VENTING. Quickdraft eliminates down-time for cleaning and replacing fan blades . . . cuts maintenance costs. It is ideal for venting paint booths . . . abrasives, corrosive gases, noxious fumes, high temperatures and moisture. For severe exposure to acids, specify our new acid-resisting plastic finish in addition to our standard acid-resisting vitreous enamel finish.

FOR MOVING AIR . . . in or out of buildings through ducts . . . Quickdraft is outstanding in efficiency.

Send for engineering data on your heating or venting applications . . . today.



N-894-QD

Quickdraft COMPANY

Dueber-Hampden Building, P. O. Box 87-K Canton 1, Ohio

WHO'S WHAT

Continued

▶ *HAYS CORP.*—Imco Equipment Co., representative in northern California.

▶ *VIKING AIR PRODUCTS*—Jack Jackson, district sales manager for Michigan, Indiana, northwestern Ohio.

▶ *PEERLESS PUMP DIV., FOOD MACHINERY AND CHEMICAL CORP.*—Max H. Richter, Jr., sales engineer for Louisiana, Arkansas; George Ries, a similar appointment for Ohio.

▶ *REDMOND CO., INC.*—James F. Pichiotino, sales manager of midwest area office.

▶ *RUUD MFG. CO.*—Mid America Appliance Corp., distributor for Nebraska; Hugh C. Murphy, district manager for Iowa; W. R. Seith, representative for southern Florida.

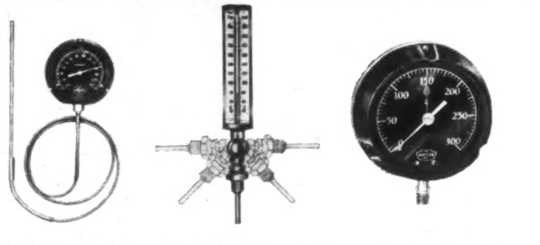
▶ *MB MFG. CO.*—Arthur C. Deichmiller, manager of new western field service office at Culver City, Calif. ⊹

WEKSLER INSTRUMENTS

for INDICATING, RECORDING & CONTROLLING TEMPERATURE, PRESSURE AND HUMIDITY

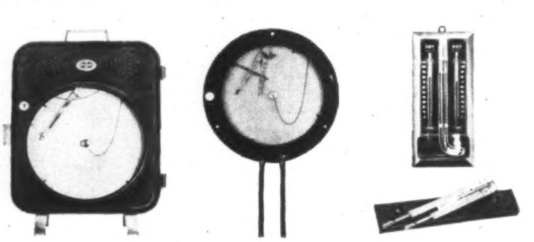
Send for Following Literature

Cat. 125A Industrial Thermometers
Cat. 225A Glass Engraved Stem Thermometers and Hydrometers
Cat. 325A Dial Indicating and Recording Thermometers
Cat. 425A General Purpose Thermometers
Cat. 525A Dial Indicating & Recording Pressure Gauges



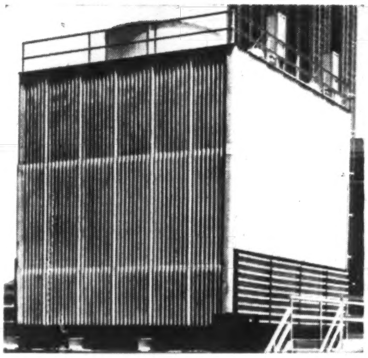
Dial Thermometer Adjust-Angle Thermometers Pressure Gauge

Portable Recorder Recording Thermometer Hygrometer & Psychrometer



WEKSLER THERMOMETER CORPORATION

195 EAST MERRICK ROAD • Dep't. HP-57 • FREEPORT, L.I., N.Y.

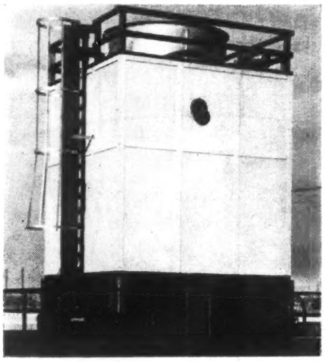


The Phillips Transite Cooling Towers have been in operation over nine years and proven to furnish the required cooling with lowest possible maintenance cost. Phillips Towers are available with framing of California Redwood or Hot Dipped Galvanized Steel as preferred.

The new Phillips nailless fill adds to simplicity of erection and maintenance.

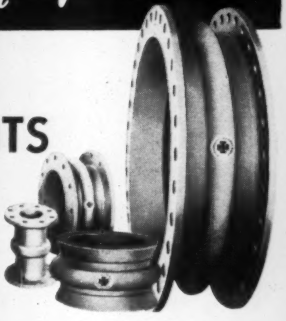
The Phillips eliminator system guarantees minimum drift loss.

When you have a cooling problem call your Phillips representative.



Phillips
Cooling Tower Co., Inc.
220 DUPONT ST., BROOKLYN 22, N.Y.

The Economical Answer to
RELIABLE PROTECTION
for Piping and Equipment



GOODALL *Rubber* EXPANSION JOINTS

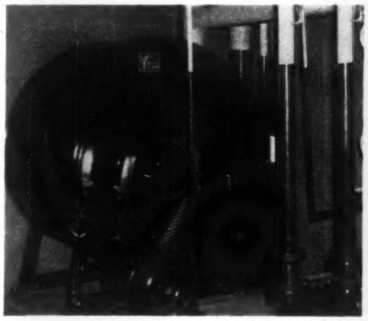
Custom-built to meet specific requirements in sizes from 3/8" I.D. to 96" I.D., for pressures up to 125 lbs. P.S.I. and/or vacuum. They are available in Right Angle and Sleeve Types, as well as "Flang-Lok"; single or multiple arch; tapered; offset; and rectangular.

LONGER SERVICE LIFE. No deterioration through embrittlement or corrosion.

SENSITIVE RESPONSE TO PRESSURE. Only slightest pressure required to create movement in the joint, in any direction. Stress on metal pipe or other connected member reduced to absolute minimum.

EASIER TO INSTALL. Light in weight . . . short face-to-face dimensions . . . retaining rings or flanges quickly aligned and bolted. No gaskets required.

AVAILABLE IN "FLANG-LOK" STYLE. A patented Goodall development which provides exceptional ease of installation; greater sealing face area; and a completely non-metallic seal.



"Rubberhide"
CORROSION-RESISTANT LININGS

If you have a corrosion problem, you can rely on Goodall engineering experience and technical skill for "RUBBERHIDE" Linings compounded to assure long-lasting protection against the particular corrosive agents involved. They will repay many times their cost through extended life of products, parts or equipment.

Produced with either rubber or neoprene as the base material. Processed to objects shipped to our Linings Plants in Trenton, Chicago or Houston; or, when the objects are too large for such shipment, or the work involves fixed plant equipment, experienced field crews do the processing "on location".

★ ★ ★

"*Long-Life*" PLASTIC PIPE **Flexible, Semi-Rigid and Rigid types, manufactured under exacting quality control to assure absolute uniformity in characteristics and dimensions.**

"If it's GOODALL, it MUST be Good!"
Contact Our Nearest Branch for Details and Prices

Standard of Quality—Since 1870
HOSE · BELTING · FOOTWEAR · CLOTHING
AND OTHER INDUSTRIAL RUBBER PRODUCTS

GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
Branches and Distributors Throughout the United States and in Canada

WE HEAR THAT . . .

▶ *WARREN ENGINEERING CO.* has purchased all valve pattern equipment, drawings, engineering and rights to manufacture from *MUELLER STEAM SPECIALTY CO.* Warren will integrate valves as formerly made by Mueller into its present line of equipment. Mueller Steam Specialty is now devoting its full time to the manufacture of pipeline strainers.

▶ *H. K. PORTER CO., INC.* plans to build a 17 story office building in Pittsburgh. The general offices of the company will occupy approximately six floors of the proposed structure and the balance will be rented to other tenants. Occupancy is expected by mid-1958.

▶ *SUPERIOR TUBE CO.* formally entered the atomic energy industry recently when the firm announced the creation of a nuclear products division. The division fabricates subassemblies and components used in the core of nuclear power reactors. *JOHN B. GIACOBBE*, former plant metallurgist, is director.

▶ The boards of directors of *PENNSYLVANIA SALT MFG. CO.* and *DELCO CHEMICALS, INC.* have approved a plan under which Pennsalt will acquire Delco. The acquisition will be accomplished through an exchange of stock. Delco's activities will become an integral part of the Chemical Specialties Div. of Pennsalt.

▶ The tradename, know-how and other assets of *METROTYPE CORP.* have been acquired by *BAILEY METER CO.* Key personnel will continue in the engineering and manufacture of "Metrotype Systems" under the new management.

▶ Formation of a new nuclear power equipment division has been announced by *KIELEY & MUELLER, INC.* The division has been awarded $750,000 in valve contracts, the company reports.

▶ Two *WORTHINGTON CORP.* "Climate Vans"—traveling showrooms of the company's latest line of packaged cooling and heating equipment—are visiting every major market in the United States, the firm reports. Designed to exhibit the Worthington line to builders, dealers, etc., all over the country, the vans were built at a cost of $100,000.

▶ *FLUID CONTROL INSTITUTE, INC.* held its fall meeting at the Edgewater Beach hotel in Chicago, recently. The meeting was presided over by the presi-

for dependable ventilation . . .

specify PENN when you specify VENTILATORS

There is a type, size and capacity for all your ventilating requirements among the complete Penn Ventilator line. Efficient and economical, Penn Ventilators are easily installed and last long, providing years of trouble-free, inexpensive ventilation. They have been removing dust, vapors, smoke, heat, fumes and odors from public, commercial and industrial buildings for more than a quarter of a century.

Write for descriptive literature on the entire line . . . and qualified recommendations, prompt quotations.

Manufacturers of: Propeller Fan — Centrifugal Fan, Stationary, Rotary and Ridge Roof Ventilators and accessory products. Representatives and distributors in principal cities.

PENN VENTILATOR CO.
Member of PFMA and AMCA

Main Office and Factory
North Goodman St. & Allegheny Ave.
Philadelphia 40, Pa.

FOR MORE THAN 25 YEARS THE BUILDERS' roof TOP LINE . . .

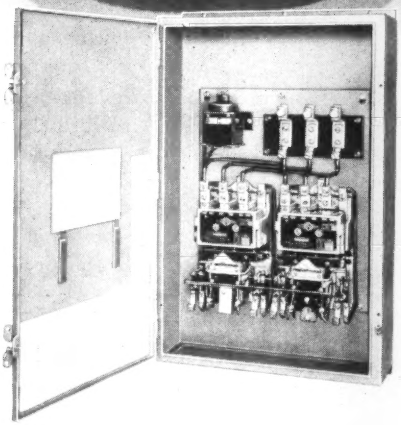
Specify

FURNAS ELECTRIC

CONTROLS for

AIR CONDITIONING

AND REFRIGERATION



Objectionable voltage drops are eliminated by using Furnas Electric Increment Starters for Part Winding motor applications. These starters have won particular acceptance for the larger horsepower air conditioning and refrigeration units.

Increment starting incorporates the advantages of other types of step starting AT THE LOWEST COST IN THE SMALLEST SPACE. Select the size you need: 10, 20*, 30, 40* and 60 hp, 220 volts. There are no costly auto transformers or resistors.

*Major savings with these "in-between" sizes.

FURNAS 25th YEAR

For information on our complete line of air conditioning and refrigeration controls, write for Bulletin 5519. Furnas Electric Company, 1041 McKee Street, Batavia, Ill.

A22

FURNAS ELECTRIC COMPANY
BATAVIA, ILLINOIS

SALES REPRESENTATIVES IN ALL PRINCIPAL CITIES

"engineer-approved"

put Extra-Profits in your pocket with

ELGEN All-Tite VANE RUNNERS

NOW IN COILS!

OPEN THIS END
PULL HERE THIS END UP USE NO HOOKS
Save Time and Money... with ELGEN All-Tite VANE RUNNERS

THE EASIEST AND QUICKEST WAY EVER DEVISED for installing single or double blade turning vanes in square elbows. No special tools required.

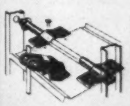
New production machinery of our own exclusive design, now enables us to produce button type Elgen All-Tite vane runners in continuous coils, effecting a savings in *your cost per job.*

COILED ELGEN ALL-TITE VANE RUNNERS MEANS . . .

- *Less Waste!* Waste pieces due to short ends are a thing of the past. Vane runner metal is coiled in 100 foot lengths, you just pull out the exact footage needed.
- *Easier Storage!* Each coil weighs approximately 50 lbs. and is packed in a box 28" x 28" x 5". Box fits easily under bench or against wall.
- *Easier Handling!* No loose pieces lying around to get in the way or collect dirt.
- *Unrolls absolutely flat!* Vane runner metal emerges from the box at bench height . . . absolutely flat . . . ready for use.

TWO MORE ENGINEER-APPROVED ELGEN PRODUCTS THAT SAVE YOU TIME AND MONEY

ELGEN SILENT DUCT . . . for forming "flexible" duct connectors. A one piece metal to material unit, packed in coils, unrolls absolutely flat. Makes on the spot work a cinch.



ELGEN DAMPERSET . . . for multi-blade dampers, parallel or opposed. Most perfect damper hardware developed.

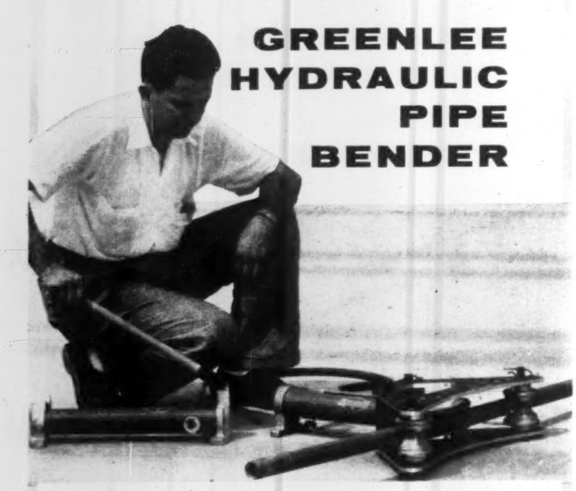
ELGEN PRODUCTS ARE SOLD THROUGH LEADING JOBBERS EVERYWHERE.

Write today for free catalog and "spec" sheet!

ELGEN MANUFACTURING CORP.
41-34 39th Street, Long Island City 4, N. Y.

save time, cut costs on your piping installations with lightweight, portable

GREENLEE HYDRAULIC PIPE BENDER



easy, fast operation makes 90° bend with one ram stroke

Quickly produce your own bends in cold pipe *right on the job* . . . exactly the way you want them, to make a correct-working, neat-fitting installation. Save hours of time, save labor, eliminate cost of many manufactured bends and fittings with the GREENLEE No. 880 Hydraulic Bender for ½″ to 2″ pipe. Easily carried and operated by *one man*. Accurate . . . makes bends to just the angle required. Fast . . . *a complete 90° bend made with one ram stroke*. Radius attachment also available for making radiant heating 180° return bends in tubing and pipe. Powerful . . . 15 tons of ram force! Easily operated by hand, or may be teamed with a GREENLEE power pump for production-line bending either in your shop or out on the job. GREENLEE line also includes larger hydraulic benders for pipe up to 5″ and hand benders for tubing and small pipe. Get the complete story on how you can speed your work, make better installations, and cut job costs with a GREENLEE Bender. Write for folder E-221.

TOOLS FOR CRAFTSMEN
GREENLEE

GREENLEE TOOL CO.
2341 12th Street, Rockford, Illinois

WE HEAR THAT

Continued

dent, *JOHN KOCH* of *CONOFLOW CORP.*, and the vice president, *DEAN E. MADDEN* of *A. W. CASH VALVE MFG. CO.*

▶ *ALPHA METALS, INC.* has opened a new sales and manufacturing division in Chicago. The plant will be known as the *ALPHA-LOY CORP.* In charge of the new organization will be *HAROLD COHN*.

▶ A new stone and steel building is the headquarters for *BRYANT MFG. CO.* at Indianapolis. The structure houses the company's general office staff, engineering and research facilities. In addition to providing much needed office space, the building will enable Bryant to conduct a comprehensive sales and engineering training program, the company says.

▶ The sales training school of the Distribution Div. of *OIL-HEAT INSTITUTE OF AMERICA, INC.* will visit the New York and Baltimore areas with three-day schools during the month of January. The school, which is especially aimed at training retail oil heating salesmen, is offered by the division to its chapters throughout the United States and Canada.

▶ *ARTHUR D. LITTLE, INC.* plans to expand its facilities in Cambridge and Concord, Mass. Purchase of 170 acres in Concord by the company's pension trust, and immediate new construction at Acorn Park in Cambridge are included in these plans.

▶ *INLAND STEEL CO.* is now in a three-year $280 million to $290 million expansion program, the company reports. *INLAND STEEL PRODUCTS CO.*, a subsidiary manufacturing steel building products, recently spent $5 million for improvements and new facilities.

▶ *TRANE CO.* plans to greatly expand its field sales force. The company is making the expansion in view of its intention of placing greater emphasis on its package air conditioning lines. Trane plans to add sales personnel experienced in package equipment selling to many of its 92 sales office staffs.

▶ *PERFECTION INDUSTRIES DIV., HUPP CORP.* will build a new 28,000 sq ft warehouse at the site of its Waynesboro, Ga., plant.

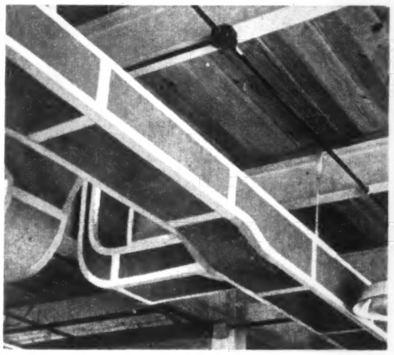
▶ A scale model of a liquid metal heated steam generator is currently being shown nationwide by its developer, *GRISCOM-RUSSELL CO.*, to engineers, research staffs, and developmental managers involved

COSTS MORE and WORTH IT!

Grant Wilson

DUX-SULATION

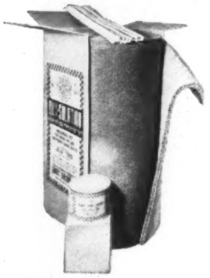
ASBESTOS PROTECTED



Despite the advent of many lower priced insulations, many of the nation's leading architects and engineers continue to specify Grant Wilson Dux-Sulation. One reason is that Dux-Sulation is just about indestructible — can't possibly be crushed or cracked. Its insulation and sound absorption efficiency, high to start with, *cannot* be impaired during installation.

Dux-Sulation can't powder, shift or sift. There are no "thin" spots, even at corners. There is no deterioration of any kind, no change of any kind. Insulating values are constant, indefinitely!

Special adhesive and tape (supplied) obviate the need for any additional "fasteners". If desired, Dux-Sulation can be applied in the shop and still withstand all necessary handling. On all counts, especially on projects where nothing less than the best is acceptable, Dux-Sulation is still your logical choice — the insulation you can specify with *absolute confidence* . . . no ifs, ands or buts!



write for
Bulletin 577H-1

Grant Wilson inc.
ASBESTOS and INSULATING MATERIALS
141 WEST JACKSON BLVD. • CHICAGO 4, ILLINOIS

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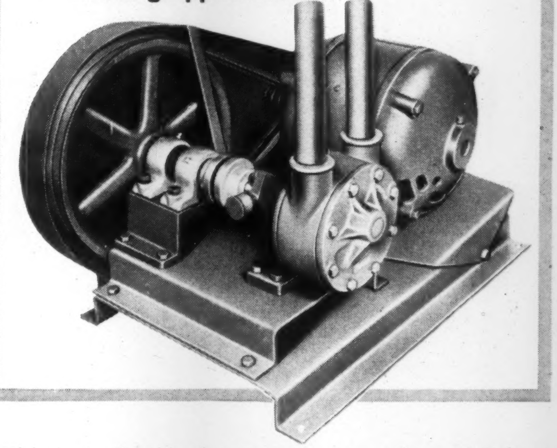
new TUTHILL SU PUMP UNIT

- **For Handling Heavy Fuel Oils**
- **In Packaged Boiler and Commercial Heating Applications**



Economically priced, TUTHILL'S SU PUMP UNIT has been specifically developed for handling heavy fuel oils in commercial heating applications and with packaged boilers.

This "v" Belt Driven Unit is compact—complete units measure only 24¼" x 14⅝". Quiet operation is insured by the 2 or 4 "v" Belt Drive and the integral gear positive displacement pump design.

Construction features which provide dependable trouble-free operation, lower maintenance costs, include two ball bearing pillow blocks, one point take-up for simple adjustment of belt tension, removable belt guard and new fabricated steel base with versatile motor mounting.

SU PUMP UNITS can be furnished with a wide variety of pumps and motors for pressures up to 300 psi, capacities to 2030 gallons per hour. Sub-assemblies of pump, stub shaft, pillow block and sub-base are also furnished separately as a unit for incorporation into systems by boiler and furnace manufacturers. Write today for complete information.

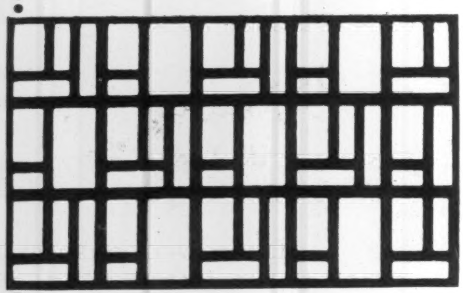
See Our Exhibit
BOOTH N-438
International Heating
and Air Conditioning
Exposition
CHICAGO
Feb. 25 to March 1

TUTHILL PUMP COMPANY
947 East 95th Street, Chicago 19, Illinois
Gentlemen:
Please forward Catalog describing Tuthill SU Pump Units.
NAME__________ COMPANY__________
TITLE__________
STREET__________
CITY__________ STATE__________

TUTHILL PUMP COMPANY
947 East 95th Street, Chicago 19, Ill.
Canadian Affiliate: Ingersoll Machine & Tool Company, Ltd., Ingersoll, Ontario, Canada

PUMPS FOR YOUR PURPOSE

FOR EXTRA
Elegance
IN INTERIORS



Hendrick Perforated Metal Grilles will greatly enhance the beauty of your decorative motif. Both eye-appealing and functional, they provide more-than-ample area for the free passage of air. Available in a wide variety of designs, they're a cinch to install . . . always lie flat, don't bend or warp.

Over one hundred designs are available to choose from . . . many are obtainable only from Hendrick. For more details call on your nearby Hendrick representative or look for our catalog in the Architectural File of Sweets Catalog.

SEE OUR CATALOG IN SWEET'S

Hendrick
MANUFACTURING COMPANY
48 Dundaff Street, Carbondale, Pa.
Sales Offices in Principal Cities

Perforated Metal • Perforated Metal Screens • Wedge-Slot and Hendrick Wedge Wire Screens • Architectural Grilles Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids Hendrick Hydro-Dehazer

WE HEAR THAT

Continued

in reactor design and application. The device incorporates a number of operational and safety features particularly applicable to using hot liquid metals to generate steam from sodium or sodium-potassium cooled reactors, the company says.

▶ Ten dealers in self contained air conditioning equipment in the New York area were inducted into the "Weathermaker $100,000 Club" of *CARRIER CORP.* at a dinner tendered to dealers by Carleton-Stuart Corp., metropolitan distributor, at the Hotel Biltmore, recently. Certificate plaques were presented to dealers who had sold more than $100,000 worth of self contained "Weathermakers" during 1955.

▶ Newest improvement at the Spokane, Wash., steel service plant of *JOSEPH T. RYERSON & SON, INC.* is a 4500 sq ft office building. It forms an integral part of the plant located in that city.

▶ *AMERICAN COILS CO.* will move its entire plant and executive offices from Newark to a new building under construction at Farmingdale, N. J. It is expected that the structure will be ready for occupancy before the end of the year. The single story facility will contain 63,000 sq ft of space and will be fully air conditioned and heated with year 'round self contained type heat pumps.

▶ *ALPHA PLASTICS, INC.* has completed a new plant to be devoted exclusively to the production of polyvinyl chloride pipe and tubing. The new and enlarged facilities, which total 12,000 sq ft, are needed to handle the increased production of corrosion resistant pipe for the chemical process and related industries, the company reports.

▶ To speed up service to its customers throughout the East Coast area, *RELIANCE ELECTRIC & ENGINEERING CO.*, has opened a new distribution center recently in Elizabeth, N. J. The plant will devote most of its 15,600 sq ft of floor space to the assembling and warehousing of motors, gear motors, drives and other products. *KENNETH R. WRIGHT* has been named supervisor of the center.

▶ *THOR POWER TOOL CO.* has opened a new branch office in Indianapolis to be headquarters for regional operations in southern Indiana and western Kentucky. Housing sales and service facilities the branch, under the direction of *RICHARD E. JAMES, JR.*, will serve an area formerly included in the company's Chicago territory.

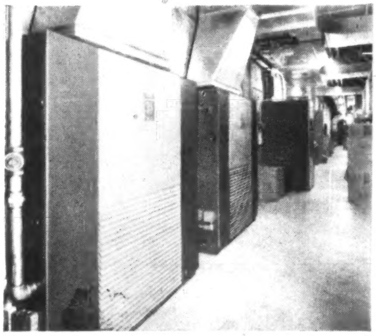
"FREON"* REFRIGERANTS IN AIR CONDITIONING

Field Reports About Successful Installations

70-store shopping center air conditioned with package units

Remotely located General Electric package units air condition all 70 stores at the big Dixie Manor Shopping Center, Louisville, Ky. Installation capacities range from 3 to 142½ tons per store.

The compact G-E package units provide two-stage modulated cooling via ducts to wall and ceiling diffusers. Store areas are divided into zones, each served by a single unit. Gas-fired furnaces deliver warm air through the same ductwork for winter heating.



Ward Refrigeration and Engineering Co. installed all package units and mechanical equipment at Dixie Manor. The shopping center's management chose a single supplier-contractor in order to standardize and simplify servicing.

Largest installation at Dixie Manor uses 10 units, totaling 142½ tons, to air condition 60,000 sq. ft.

Top performance in large-scale air conditioning with package units is strikingly demonstrated at the Ben Snyder department store (above). Biggest tenant in the 70-store Dixie Manor Shopping Center, Louisville, Ky., Snyder's 60,000-sq.-ft. area is cooled by one 7½-ton and nine 15-ton G-E units. To save space, units are installed outside the conditioned area.

Each package unit delivers two-stage modulated cooling through wall and ceiling diffusers to a specific zone in the store. This arrangement makes possible a flexible system of local temperature control.

Another installation of package units for cooling large areas is at the Park & Shop Super Market (above) in Dixie Manor. Said to be the largest supermarket in the United States, Park & Shop uses six 15-ton G-E units to air condition its 46,000-sq.-ft. area.

You can specify a "FREON" refrigerant for any air conditioning or refrigeration application

"Freon-22" refrigerant is used in G-E package units to help assure years of trouble-free performance. No component of a cooling system is more important than the refrigerant. That's why you should always specify "Freon" for the jobs you do.

You can be sure "Freon" refrigerants will never give you any trouble from acids or moisture. "Freon" refrigerants are safe—nonflammable, nonexplosive, virtually nontoxic. Your complete air conditioning and refrigeration wholesaler can promptly supply a "Freon" refrigerant for any size or type of installation.

For more information or technical data on uses of "Freon" write to E. I. du Pont de Nemours & Co. (Inc.), "Kinetic" Chemicals Division 71, Wilmington 98, Del.

DU PONT
REG. U. S. PAT. OFF.

FREON

KINETIC

REFRIGERANTS

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

**"Freon" is Du Pont's registered trademark for its fluorinated hydrocarbon refrigerants.*

WE HEAR THAT

Continued

▶ *TRANE CO.* plans to double its present research and testing facilities and to build two new manufacturing plants, one to produce brazed aluminum special heat transfer units and the other to manufacture low horsepower air conditioning compressors. The projects bring to $13 million Trane's building and expansion program for 1956 and 1957, the company reports.

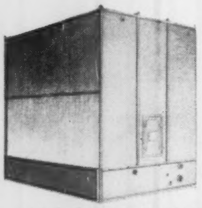
▶ Citations for 25 years of service for 10 of its personnel have been announced by *POWERS REGULATOR CO.* Recipients include: Robert Guhr, purchasing agent, Skokie, Ill.; Gerald Harrison, sales engineer, New York; Arthur Jenkins, accountant, Skokie; James Joyce, sales engineer, Atlanta; C. P. Krantz, district manager, Cincinnati; John Millus, turret lathe operator, Skokie; Joseph Reiss, shipping clerk, Skokie; R. M. Spencer, district manager, Kansas City; D. A. Stott, Canadian division manager, Toronto; Merle Weninger, branch manager, Syracuse.

▶ To celebrate its accreditation by the National Home Study Council, *UTILITIES ENGINEERING INSTITUTE*, Chicago, recently held an open house, attended by over 300. Guests toured the school's classrooms and various training shops, including the refrigeration, air conditioning and heating student facilities. Present were representatives of *BELL & GOSSETT CO.*, *TRANE CO.*, *MUELLER BRASS CO.* and *STANDARD REFRIGERATION CO.*

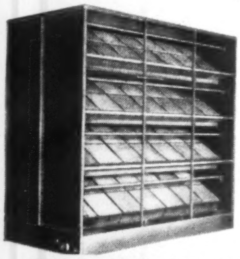
▶ *BURNHAM CORP.* was named "Firm of the Year" by the chamber of commerce of the Tarrytowns and Irvington, N. Y. At a dinner attended by over 500 guests, *BURNHAM BOWDEN*, president, was presented with a scroll in honor of the company's 100th anniversary.

▶ *J. K. CAMPBELL*, sales engineer for *DUNHAM-BUSH, INC.*, addressed the *REFRIGERATION SERVICE ENGINEERS SOCIETY* at its eighth annual midwest educational conference held recently at Dodge City, Kan. Mr. Campbell spoke on "Low Side Selection."

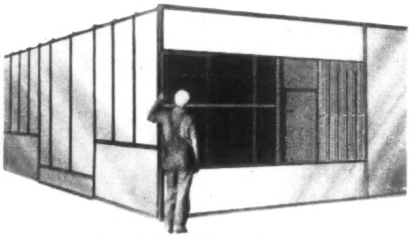
▶ Veteran sales representatives currently marking 10 and 20 years of service with *SIMPSON ELECTRIC CO.* were recipients of service awards at the company's recent annual sales conference at Lac Du Flambeau, Wis. +



SPRAY AIR WASHER
SINGLE AND TWO BANK DESIGNS AVAILABLE IN A WIDE RANGE OF SIZES. FACTORY INSULATED CONSTRUCTION ILLUSTRATED



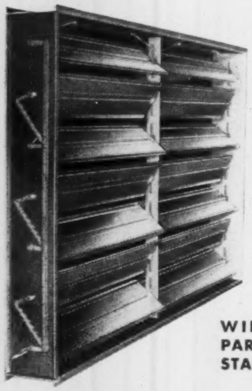
CAPILLARY AIR WASHER
CLASS I (CONCURRENT) SHOWN. CONSTRUCTED FOR 1000 TO 160,000 CFM THESE WASHERS OFFER PATENTED FEATURES FOR HIGHEST EFFICIENCY



ARTICULATED UNIT
THESE COMPLETE FACTORY INSULATED UNITS COMBINE PANELS, DAMPERS, WASHER OR SURFACE DEHUMIDIFIER AND OTHER FEATURES IN A SINGLE CO-ORDINATED ASSEMBLY.

AIR CONDITIONING EQUIPMENT

OTHER A & R PRODUCTS
FACTORY INSULATED PANELS
METAL CELL WASHERS
SPECIAL PURPOSE DRYERS



LOUVRE DAMPERS
WIDE FRAME CONSTRUCTION SHOWN. PARALLEL OR PROPORTIONING ACTION WITH STAINLESS STEEL SHAFTS AND BRONZE BEARINGS

AIR & REFRIGERATION CORPORATION
439 MADISON AVE. • NEW YORK 22, N. Y. • ATLANTA, GA.
SALES REPRESENTATIVES IN PRINCIPAL CITIES

A&R

"I could see the corpsman kneeling over me. The blood plasma was running down through a tube into my arm and he said everything was going to be O.K. I was walking across an enemy mine field in Seoul when one exploded and a piece of shrapnel caught me in the leg.

" 'Got enough of that stuff?' I asked him, pointing to the blood. 'I guess we never have enough,' he said, 'but you can thank *somebody* for this pint.'

"How do you thank 'somebody' for blood? For saving your life? When I got back home, I discovered the answer at my local blood donor center. There's only *one* way to say thanks—by giving some of your own blood."

"How do you thank 'somebody' for Blood?"

Yes, all kinds of people give blood—for all kinds of reasons. But whatever *your* reason for giving blood, this you can be sure of: Whether your blood goes to a combat area, a local hospital, or for Civil Defense needs—this priceless, painless gift will some day save an American life!

Business Executives!

✓Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

☐ Have you given your employees time off to make blood donations?

☐ Do you have a Blood Donor Honor Roll in your company?

☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?

☐ Have you arranged to have a Bloodmobile make regular visits?

☐ Has your management endorsed the local Blood Donor Program?

☐ Have you informed employees of your company's plan of co-operation?

☐ Was this information given through Plant Bulletin or House Magazine?

☐ Has your company given any recognition to donors?

☐ Have you conducted a Donor Pledge Campaign in your company?

Remember, as long as a *single* pint of blood may mean the difference between life and death for *any* American . . . the need for blood is *urgent!*

Give Blood Now—Call Your Red Cross Today!

National Blood Program

Handle HIGH STATIC HEADS with greatest EFFICIENCY!

— in skyscrapers or buildings like this —

LOUIS CHECKMAN PHOTO

with American-Marsh TYPE HLM-HIM Split-case Centrifugal Pumps

To insure years of efficient pumping service in the beautiful, modern NEA Educational Center, Washington architects *Joseph H. Saunders, A.I.A.*, selected *four* Type HLM-HIM American-Marsh Pumps.

In skyscrapers too, they're often installed because they're *properly designed and built* to handle *extremely high static heads.*

Such quality features as purge-type grease lubrication, heavy-section casings and extra-deep stuffing boxes recommend them to you. But get *all* the details . . .

WRITE for new HLM-HIM Bulletin 350 with cutaway views and performance data!

Pumps and Pumps only Since 1873

AMERICAN-MARSH PUMPS

BATTLE CREEK MICHIGAN

In Canada:
American-Marsh Pumps (Canada) Ltd., Stratford, Ont.

CENTRIFUGAL, TURBINE, STEAM AND POWER PUMPS FOR TESTING, PROCESSING, BOILER FEED, FIRE PROTECTION, ETC

MEETINGS & CONVENTIONS

JAN. 21-22—*Today's Tool for Tomorrow's Research*, symposium on solar furnace design and operation. Hotel Westward Ho, Phoenix. Sponsored by the Association for Applied Solar Energy, in conjunction with Stanford Research Institute, Arizona State College at Tempe and University of Arizona. Information: John I. Yellott, secretary of the association, 3424 N. Central Ave., Phoenix.

JAN. 23-25—*Instrumentation for the Process Industries*, 12th annual symposium. Texas A & M College. Information: Dr. C. D. Holland, Dept. of Chemical Engineering, Texas A & M College, College Station, Tex.

JAN. 28-31—*Eighth National Plant Maintenance & Engineering Show*. Public Auditorium, Cleveland. Information: Clapp & Poliak, Inc., 341 Madison Ave., New York 17.

FEB. 4-8—*American Society for Testing Materials*, committee week. Benjamin Franklin Hotel, Philadelphia. ASTM headquarters: 1916 Race St., Philadelphia 3.

FEB. 5-7—*12th SPI Reinforced Plastics Division Conference*. Edgewater Beach Hotel, Chicago. Society of the Plastics Industry, Inc., 250 Park Ave., New York 17.

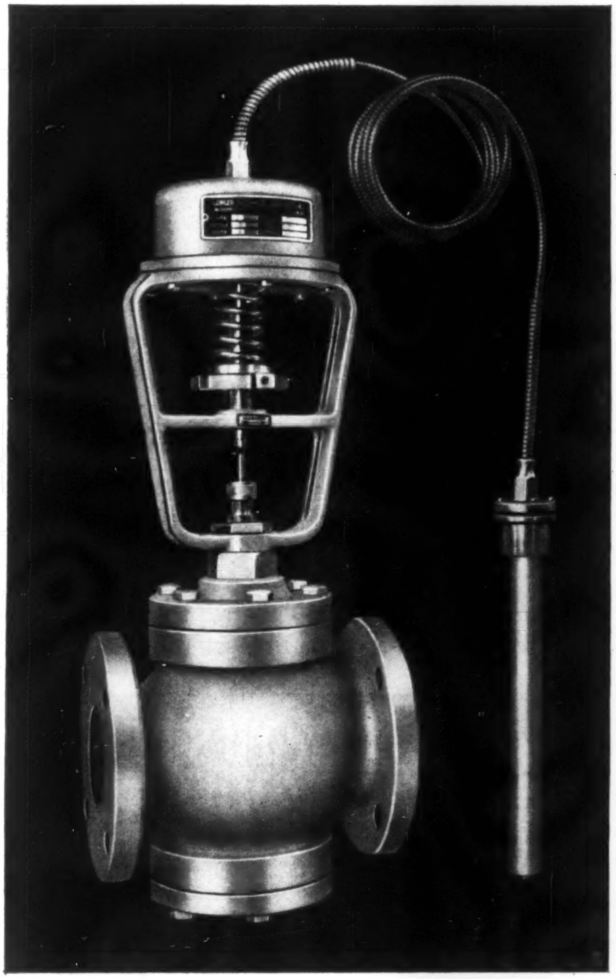
(*Air Conditioning, Ventilating and Electric Space Heating Exposition*, previously announced on these pages as being scheduled for February 8-10 at Washington, D.C., has been cancelled, according to an announcement from the Electric Institute of Washington.)

FEB. 18-21—*Sixth Annual Industrial Ventilation Conference*. Kellogg Center, Michigan State University. Information: Industrial Ventilation Conference, Continuing Education Service, Michigan State University, East Lansing, Mich.

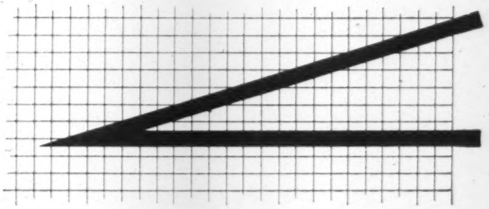
FEB. 25-28—*American Society of Heating and Air-Conditioning Engineers, Inc.*, 63rd annual meeting. Conrad Hilton Hotel, Chicago. Information: A. V. Hutchinson, executive secretary, ASHAE, 62 Worth St., New York 13. (The meeting program appears on page 208 of this issue.)

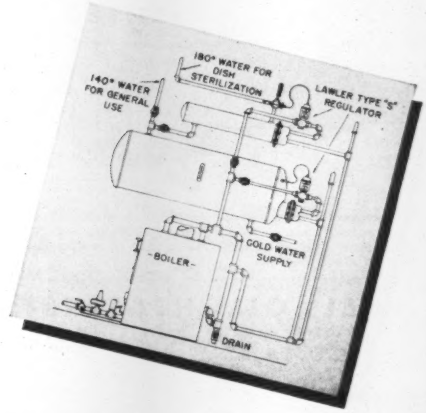
FEB. 25-*MARCH* 1—*13th International Heating and Air-Conditioning Exposition*. International Am-

INSTANT PROTECTION...



PRECISION CONTROL!




180° WATER FOR DISH STERILIZATION
140° WATER FOR GENERAL USE
LAWLER TYPE "S" REGULATOR
-BOILER-
COLD WATER SUPPLY
DRAIN

LAWLER TYPE "S" TEMPERATURE REGULATOR

DIRECT ACTING — Accurately controls all steam heating equipment. Protects against over heating... a rise in temperature above setting closes valve.

REVERSE ACTING — For cooling systems and recirculating lines. Rising temperature opens valve... drop in temperature causes valve to close.

THREE WAY — Mixes hot and cold liquids . . . delivers them at a constant pre-determined temperature.

ONE DEGREE OFF — up or down, and the Lawler Type "S" Temperature Regulator is in action... correcting to and maintaining the desired temperature.

Hydraulically formed bellows are non-ferrous, give "hair-line" control with instant response. Highly polished stainless steel valve stem provides friction-free operation for real rugged performance . . . longer lasting durability.

There's no job too tough... too unique for the Type "S". It's available in many variations for any special purpose. In industry, dairies, food processing, Diesel engineering... where ever steam, gases or fluids are used, the Lawler Type "S" Temperature Regulator will do an excellent control job for your customer.

PERFORMANCE TESTED FOR LONGER LIFE

Steam Temperature Regulators
Thermostatic Shower Mixing Valves
Water Controllers
Tempering Valves

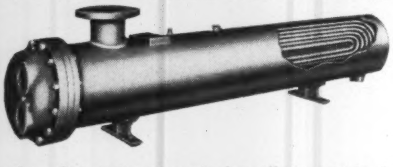
DESIGNERS AND PRODUCERS OF THERMOSTATICALLY OPERATED VALVES SINCE 1895

THE Lawler Line of Thermostatic Control Valves

LAWLER AUTOMATIC CONTROLS, INC., MT. VERNON, N. Y.

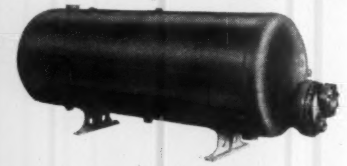
WHITLOCK
HEATING AND COOLING
Equipment

✓ INSTANTANEOUS HEATERS



For use where hot water at a nearly uniform rate is desired. Type R shown has a removable U-tube bundle; other designs are available. Write for Bulletin 20A. Write for details on stock heaters.

✓ STORAGE HEATERS

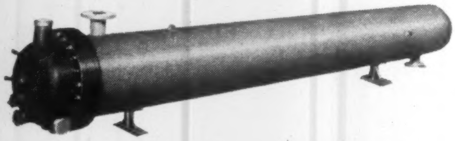


Type K Storage heaters supply ample hot water at all times. Whitlock-Everdur construction assures lifetime service: Also made in Eterno and Standard Steel. See Bulletin 40A. Write for details on stock heaters.

FUEL OIL HEATERS

Preheating promotes efficient atomization and burning. Type V-1 Heater shown is easily cleaned without breaking line connections. Whitlock heaters are made in a wide range of types and sizes. Ask for Bulletin 35.

✓ WATER CHILLERS



For Air Conditioning service Whitlock chillers are built to meet specific job requirements. The dry expansion cooler illustrated is of U-bend design; refrigerant passes through the tubes and cools water in shell — thus less refrigerant is required and danger of freeze-ups is greatly reduced. Ask for recommendations. Write for Bulletin 140.
Whitlock Engineering Service is complete — Bring your heating or cooling problems to us.

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phitheater, Chicago. Under management of International Exposition Co., 480 Lexington Ave., New York.

MARCH 11-15—*National Association of Corrosion Engineers*, annual conference and exhibition. Kiel Auditorium, St. Louis. NACE headquarters: 1061 M&M Bldg., Houston 2.

MARCH 11-15—1957 *Nuclear Congress*. Convention Hall, Philadelphia. Information: Engineers Joint Council, 29 W. 39th St., New York 18.

MARCH 18-21—*Society of the Plastics Industry*, annual national conference and Pacific Coast plastics exposition. Hotel Biltmore and Shrine Exposition Hall, Los Angeles. SPI headquarters: 250 Park Ave., New York 17.

MARCH 27-29—19*th Annual American Power Conference*. Hotel Sherman, Chicago. Information: Illinois Institute of Technology, 35 W. 33rd St., Chicago.

APRIL 8-12—*American Welding Society*, national spring meeting. Hotel Sheraton, Philadelphia. To be

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INDUSTRIAL
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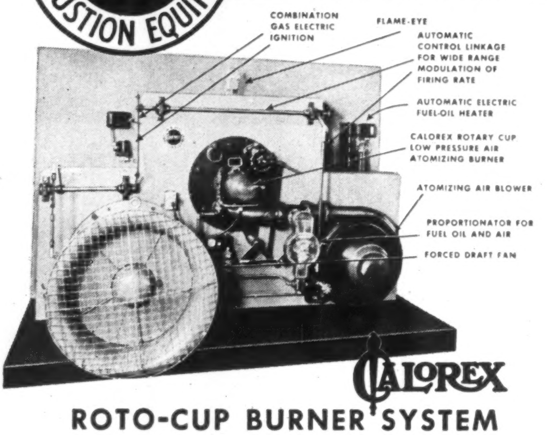
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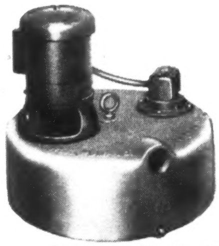

SINGLE UNIT—Fig. 302A
10 Gal. Receiver for Single Units
Diameter 21″
Hgt. of Return above floor 6⅞″

Capacities 500 to 15,000 sq. ft. E.D.R.

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LOW SPEED, LONG LIFE
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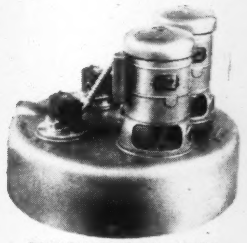

DUPLEX UNIT—Fig. 303B
15 Gal. Receiver for Single or Duplex Units
Diameter 25½″
Hgt. of Return above floor 7 3/16″

Unit Number	Max. Sq. Ft. Direct Radiation	Disch. Press. In Lbs. At Pump	GPM Radiation Will Condense	Capacity of Pump in GPM	Motor H.P.	Return Inlet in Inches	Pump Discharge in Inches	Diameter and Capacity of Receiver	Height of Return to Centerline
TVC-19	750	20	.38	1.5	¼	2	1	21″ -10 Gal.	6⅞″
TVC-23	1000	20	.5	1.5	¼	2	1	21″ -10 Gal.	6⅞″
TVC-29	2000	20	1.0	3.0	¼	2	1	21″ -10 Gal.	6⅞″
TVC-35	4000	20	2.0	6.0	¼	2	1	21″ -10 Gal.	6⅞″
TVC-41	6000	20	3.0	9.0	⅓	2	1	21″ -10 Gal.	6⅞″
TVC-47	8000	20	4.0	12.0	½	2	1	25½″-15 Gal.	7 3/16″
TVC-52	10000	20	5.0	15.0	¾	2	1	25½″-15 Gal.	7 3/16″
TVC-54	15000	10	7.5	22.5	½	3	1¼	25½″-26 Gal.	10½″
TVC-55	15000	20	7.5	22.5	¾	3	1¼	25½″-26 Gal.	10½″
TVC-56	15000	30	7.5	22.5	1	3	1¼	25½″-26 Gal.	10½″
TVC-57	15000	40	7.5	22.5	1½	3	1¼	25½″-26 Gal.	10½″

Intermediate Sizes Based Upon Discharge Pressure Required Are Available.

See Bulletin TVC-300-C for Full Specifications

See Catalog in 1957 Sweet's and 1957 Domestic Engineering Catalog Directory

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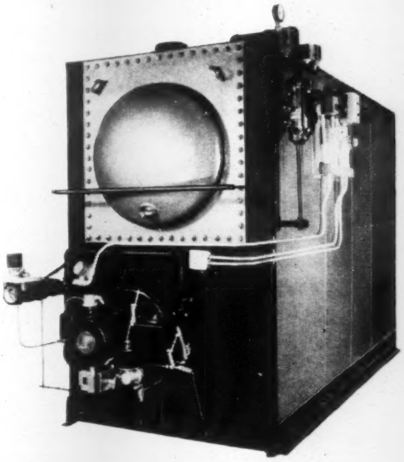

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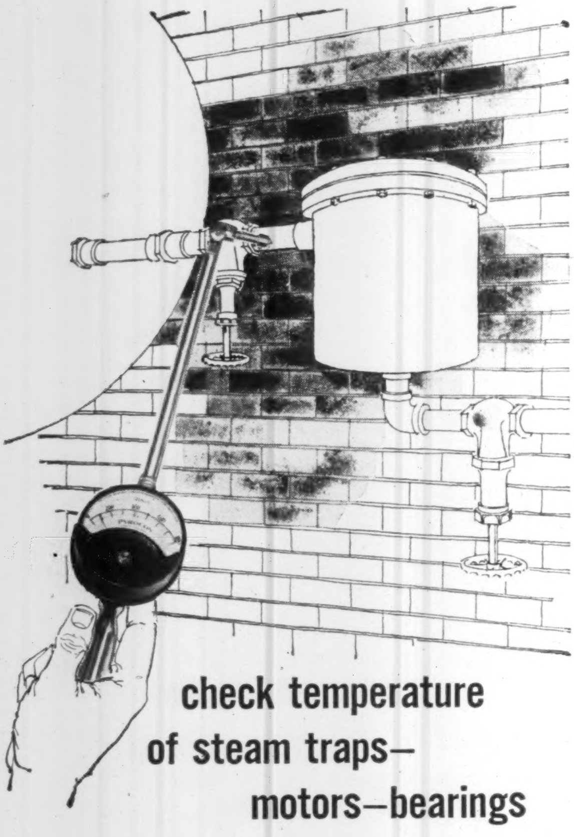

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APRIL 14-17—*Building Research Institute*, annual meeting. Edgewater Beach Hotel, Chicago. BRI headquarters: 2101 Constitution Ave., Washington 25, D.C.

APRIL 14-27—*United States World Trade Fair*. Coliseum. New York. Information: United States World Trade Fair, 331 Madison Ave., New York.

MAY 3-7—*Western Air Conditioning, Heating, Ventilating and Refrigeration Conference and Exhibit*. Shrine Exposition Hall, Los Angeles. Information: Fred J. Tabery, 3143 S. Hill St., Los Angeles.

MAY 6-8—*Air-Conditioning and Refrigeration Institute*, annual meeting. The Homestead, Hot Springs, Va. ARI headquarters: 1346 Connecticut Ave., N.W., Washington 6, D.C.

MAY 7-10—*Mechanical Contractors Association of America*, annual meeting. Hotel Fontainebleau, Miami Beach. The association is at 30 Rockefeller Plaza, New York 20.

MAY 20-24—*National Fire Protection Association*, annual meeting. Hotel Statler, Los Angeles. NFPA headquarters: 60 Batterymarch St., Boston.

JUNE 2-5—*American Society of Refrigerating Engineers*, annual meeting. Hotel Fontainebleau, Miami Beach. ASRE headquarters: 234 Fifth Ave., New York.

JUNE 3-6—*National District Heating Association*, 44th annual meeting. The Homestead, Hot Springs, Va. Information: John F. Collins, Jr., secretary-treasurer, NDHA, 827 N. Euclid Ave., Pittsburgh.

JUNE 3-7—*Oil-Heat Institute of America, Inc.*, 35th annual convention. Sheraton-Plaza Hotel, Boston. OHI headquarters: 500 Fifth Ave., New York 36.

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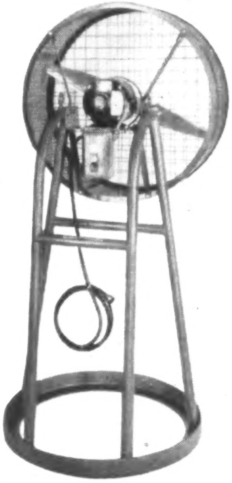

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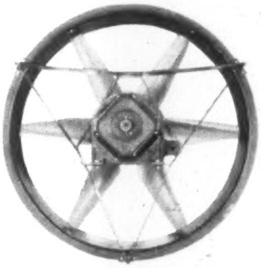

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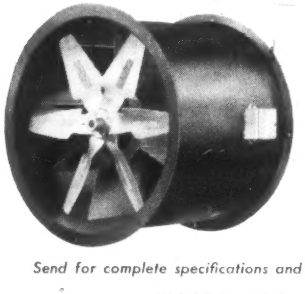

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Direct drive model shown, also supplied with belt drive for high temperatures or corrosive air and gas handling. Designed for bolting in any duct run at any point or at either end. Sizes: 16" to 36" fans.

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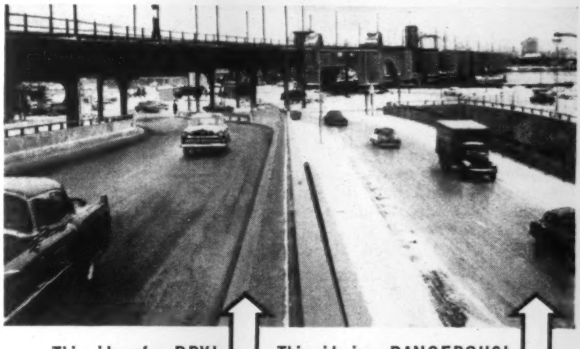

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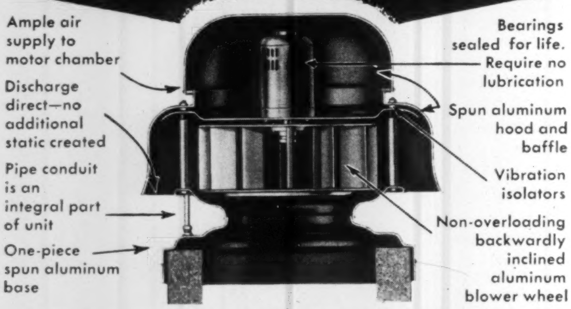
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JUNE 16-21—*American Society for Testing Materials*. Chalfonte-Haddon Hall, Atlantic City. ASTM headquarters: 1916 Race St., Philadelphia 3.

JUNE 24-27—*American Society of Heating and Air-Conditioning Engineers, Inc.*, semi-annual meeting. Murray Bay, Quebec. Information: A. V. Hutchinson, executive secretary, ASHAE, 62 Worth St., New York 13.

AUG. 11-15—*First National Conference on Applied Heat Transfer*. Pennsylvania State University, University Park, Pa. Sponsored by heat transfer division and central Pennsylvania section of American Society of Mechanical Engineers in cooperation with College of Engineering and Architecture of the University. ASME headquarters: 29 W. 39th St., New York 18.

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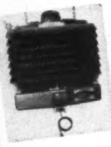

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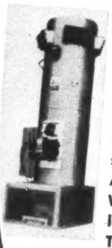

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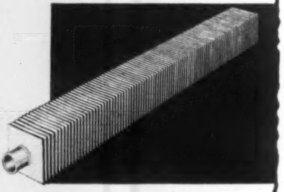

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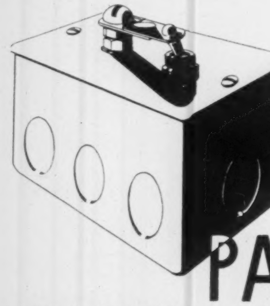

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OCT. 7-9—*American Gas Association*, annual convention. Kiel Auditorium, St. Louis. AGA headquarters: 420 Lexington Ave., New York 17.

NOV. 14-16—*American Society of Refrigerating Engineers*, semi-annual meeting. Morrison Hotel, Chicago. ASRE headquarters: 234 Fifth Ave., New York.

NOV. 18-21—*10th Exposition of the Air-Conditioning and Refrigeration Industry*. International Amphitheater, Chicago. Air-Conditioning and Refrigeration Institute, 1346 Connecticut Ave., N. W., Washington 6, D.C.

NOV. 18-22—*National Warm Air Heating and Air Conditioning Association*, committee meetings and annual convention. Morrison Hotel, Chicago. NWAHACA headquarters: 640 Engineers Building, Cleveland 14.

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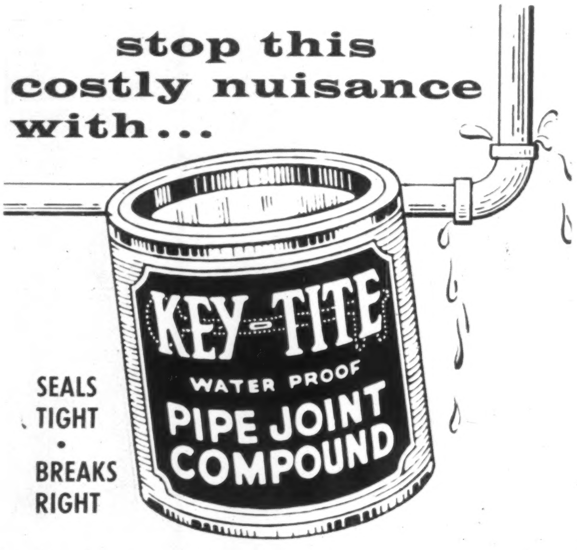

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OLSON HEATERS GIVE YOU THE PLUS

Low initial cost and ready heat without costly installation delays. Reverse current gas travel and extra heat transfer surfaces for extreme efficiency. Completely automatic, no high priced attendants necessary. Engineered for perfection, built for toughness. Olson is truly the answer to a space heating problem. Write for complete information and data today.

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GAS, OIL, OR DUAL GAS AND OIL CAPACITIES
FROM 300,000 TO 2,000,000 BTU

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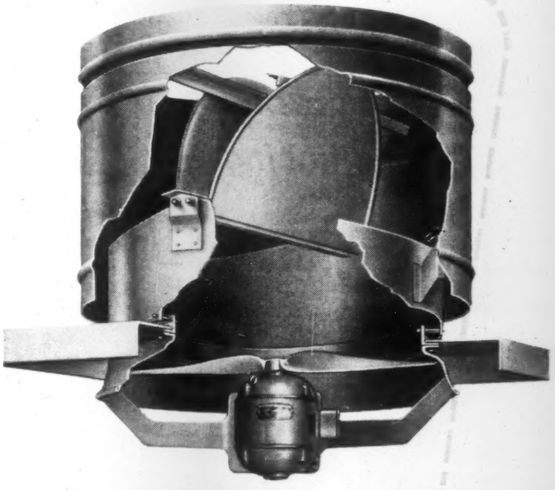
Canfield, Ohio

REPRESENTATIVES IN PRINCIPAL CITIES

SKY-BLAST®

moves more air at less cost



...powerful roof ventilator with
NEW Smoke Trip Damper Opener

Because Propellair Sky Blast roof ventilators do not need the usual restricting weather cover which deflects and reduces air movement, they move more air at less cost. Fumes and heat are thrown high into the air, can't re-enter windows or turn downward to create roof maintenance problems. Their efficiency is not effected by wind velocity or direction. Weatherproof dampers open automatically when fan is started. Hot-dip galvanized after fabrication, Propellair Sky Blast ventilators are ruggedly built to give years of maintenance-free service. Available in sizes from 16" to 60" for 2820 to 78,800 CFM—PFMA Certified Ratings.

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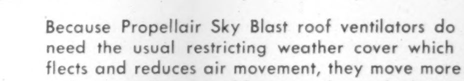
DIV. OF ROBBINS AND MYERS, INC.
SPRINGFIELD, OHIO

Certified Ratings PFMA



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NEW BOOKS & REPORTS...

Air Conditioning, Refrigerating Data Book, 1956-57—Applications volume. Sixth Ed. American Society of Refrigerating Engineers, 234 Fifth Ave., New York 1. $10.00.

Heating and Air Conditioning—By Burgess H. Jennings. 598 pp. International Textbook Co., Scranton 9, Pa. $8.50.

Refrigeration and Air Conditioning—Second Ed. By Richard C. Jordan and Gayle B. Priester. 555 pp. Prentice-Hall, Inc., 70 Fifth Ave., New York 11. $8.00.

1955 Proceedings of the National District Heating Association—239 pp. NDHA, 827 N. Euclid Ave., Pittsburgh 6. $10.00.

Symposium on High-Purity Water Corrosion—ASTM special technical publication 179. 56 pp. American Society for Testing Materials, 1916 Race St., Philadelphia 3. $1.75.

Brown's Directory of American Gas Companies—1956-57 Ed. 515 pp. Brown's Directory, 48 W. 38th St., New York 18. $35.00. ✛

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ROOF COOLING

- Reduces Air Conditioning loads as much as 25%.
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- Millions of square feet of roofs are cooled by A.S.*

Besides cooling "under-roof" areas, April Showers add longer life to roofs, gives added protection in case of fire and acts as a lightning arrestor. WRITE for detailed technical data.

*April Showers are patented.

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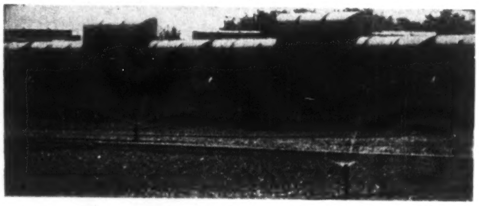

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Featuring:

Ⓐ **Simplicity of installation**
Ⓑ **Efficient heating performance**
Ⓒ **Harmonious design**
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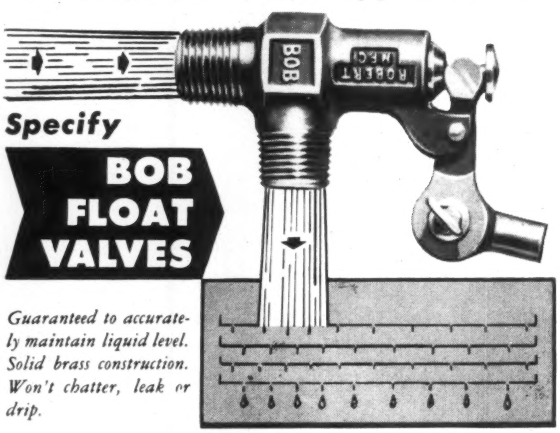
The Standard Valve For COOLING TOWER applications...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BOB FLOAT VALVES
Guaranteed to accurately maintain liquid level. Solid brass construction. Won't chatter, leak or drip.

Standard equipment for Major COOLING TOWER manufacturers and piping fabricators for POSITIVE-ACTION and unsurpassed performance under the toughest service conditions. Take advantage of the savings thru standardization *—one source for completeness of line—smaller and more flexible inventory—preventive maintenance—safety—durability—interchangeability—increase of sales—customer satisfaction and* ECONOMY.

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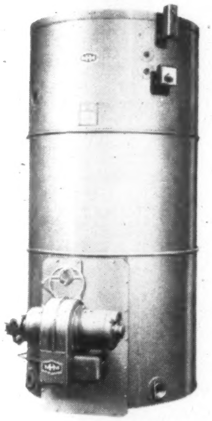

Gross outputs from 100,000 BTUH to 1,000,000 BTUH. Available in eleven sizes, gas or oil fired—steam or water.

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MOF-1035 and
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Developed for and used by Atomic Energy Commission

FLANDERS *Airpure* FILTERS

99.95% clean air efficiency

on 0.3 micron size particles

NOW available for Industrial and Commercial use

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AIRPURE filters are manufactured of tightly pleated fibrous texture and scientifically designed to remove extremely small particulate materials from air and gas streams. AIRPURE filters do trap airborne particles as small as 0.1 micron in diameter. Each filter is DOP tested for air resistance and smoke penetration before leaving factory. AIRPURE filters have long serviceable life and require no maintenance once installed.

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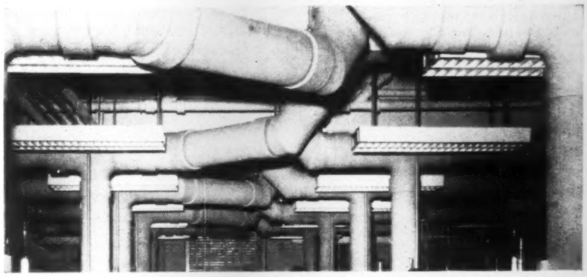
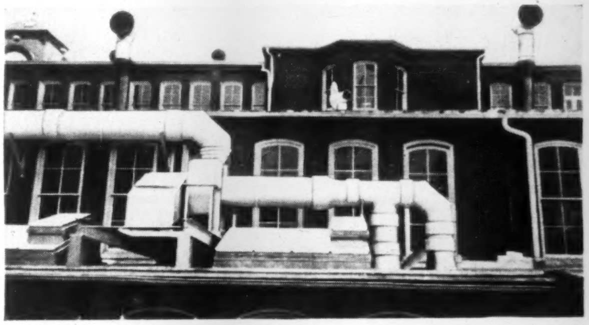
Riverhead, New York

Lick vent problems...



caused by corrosion...



...and by weather

with

TRANSITE INDUSTRIAL VENT PIPE

WITH Transite® Industrial Vent Pipe you're sure of long, trouble-free service—thanks to the twofold protection it provides:

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Transite Industrial Vent Pipe offers other advantages, too. A wide variety of fittings and pipe sizes makes it adaptable to every industrial venting service. The ease with which this pipe can be cut and handled on the job makes for important installation economies.

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JOHNS-MANVILLE JM PRODUCTS

Johns-Manville
TRANSITE INDUSTRIAL VENT PIPE
AN ASBESTOS-CEMENT PRODUCT

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Is the quick, economical way to find what you're looking for. Check the classified page each and every issue for real bargains and hard to find items. It's a quick and sensible means too, of disposing of tools, equipment, and anything else for which you no longer have use. Check the succeeding page for rates.

for sale . . .

DIRECT FIRED HEATER — Established Direct Fired Heater Company with complete line of accepted equipment suitable for use with oil, gas or combination fuels will entertain a merger or sale proposal. Key personnel available. Complete resume of operations furnished on request. Please reply to Key 1291A, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2, Ill.

situations open . . .

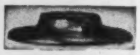
HEATING MANAGER
Large wholesale heating supply dept. Good salary, benefits. Address Key 1282A, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2, Ill.

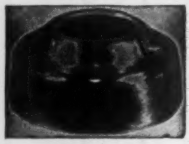
PURCHASING AGENT
For large plumbing and heating supply. Must be experienced. Good salary and opportunity. Confidential. Address Key 1283A, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2, Ill.

Mechanical and electrical engineers needed by established mid-western consulting firm with top grade architectural clientele. Excellent opportunity for advancement and top salaries for qualified men. Our employees know of this advertisement. Address Key 1287A, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2, Ill.

AIR-CONDITIONING
SALES ENGINEER

A national manufacturer of diversified consumer and industrial air-conditioning products is seeking an ambitious young man for assignment in the metropolitan New York area. He should be experienced in the sale of fan coil and self-contained units and established in contacts with consulting engineers, air-conditioning contractors, architects and builders. Age 28-40. College graduate, ME preferred. Local travel only. Starting salary to $8000. Excellent benefits. ALSO POSSIBLE SAME OPENING IN MIDWEST. SEND COMPLETE RESUME. ADDRESS KEY 1286A, HEATING, PIPING & AIR CONDITIONING, 6 N. MICHIGAN AVE., CHICAGO 2, ILL.


No. 1
Made solid only
Flat Type


No. 36A
Made split or solid
Clears sleeve 1" high

"RITTER" CAST FLOOR & CEILING PLATES
CAST IRON & CAST BRASS

Ritter Floor & Ceiling Plates are solidly constructed, well designed, and superbly finished. Ritter plates meet City, State & Federal Specifications. We stock all sizes and styles, split or solid; in plain, Nickel or Chrome Plated finish from 1/4" to 12" pipe size. Any special sizes, heights or shapes can be furnished.

Ritter plates have been furnished for: V A Hospitals, Schools, Housing Projects, Terminals, Office Buildings and the United Nations.

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Write For Circulars

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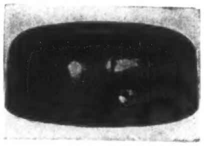
120 WALKER STREET, NEW YORK, N. Y.

No. 3A
Made split or solid
Clears sleeve 1/4" high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Made in two halves. Held by two screws. All dimensions to specifications.

We're SPECIALISTS

in Air Conditioning SUPPLIES and PARTS

In this new DEPENDABOOK you'll find over 10,000 items — the LARGEST Selection in the World!

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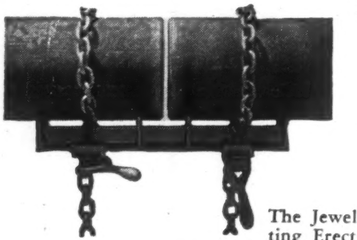
PIPE WELDING CLAMPS THAT MAKE WELDING PAY



- Pipe clamps
- Flange Clamps
- Elbow Clamps
- Angle Clamps
- Pipe Markers

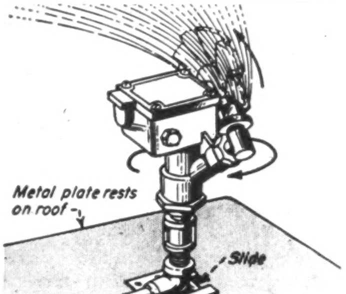
TWO SIZES
1/2 to 8 in. 8 to 16 in.
Light—Adjustable—Fast

The Jewel System of Pipe and Fitting Erection Ready for the Weld Keeps the Welder Welding Instead of Waiting
CUTS ERECTION COSTS
Modernize Your Own Methods and Tool Equipment

JEWEL MANUFACTURING COMPANY
1841 University Ave., St. Paul, Minn.

COOL any building from the ROOF

effectively efficiently economically


Metal plate rests on roof
Slide

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Box 43555 Los Angeles 43, Cal.

. . . find what you need quickly and economically through . . .

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Rates for classified advertising are 15 cents for each word including heading and address. One inch $7.00. Count nine words for keyed address. Minimum $2.50 for each insertion. Cash must accompany order. Closing date 10th of month preceding issue.

agents wanted . . .

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NEEDS REPRESENTATIVES

As a result of newly developed production capacity, our sales goals require that we make changes or add new representation in 18 key territories.

Line includes Forward Curve, Backward Inclined, Industrial, Pressure and Propeller types of fans. All equipment fully tested in accord with association standards.

All territories on exclusive representative basis. Coverage required in both industrial and heating and ventilating markets. Write J. Kassel for details.

GENERAL BLOWER COMPANY
8610 Ferris Avenue
Morton Grove, Illinois

See us at the ASHAE show in February: Exhibit #632

AGENTS WANTED: Representatives needed by National Manufacturers of Noise Control Products for industrial application. We manufacture mufflers for medium high and low Air-Conditioning systems as well as all other phases of Air-Conditioning systems. Our business has grown over 500% in the last year. Our products help eliminate one of industry's biggest problems. Send detailed information on what lines you presently handle. MIDWEST NOISE CONTROL, 6265 Carrollton, Indianapolis 20, Indiana.

situations wanted . . .

PROFESSIONAL ENGINEER in private practice in Philadelphia area seeks promising high level connection. BSME, twenty years broad experience building mechanical services, specializing air conditioning. Minimum base salary $12,000. Reply fully. Address Key 1290A, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2, Illinois.

Do you need proven executive to manage your business or direct your sales organization? Experience in sales and management of retail, wholesale phases of heating and air conditioning. Address Key 1288A, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2, Ill.

SALES AND SERVICE ENGINEER. Air conditioning and allied equipment, 39, British, experience Brazil, emigrating U. S. April desires domestic or export employment U. S. or Canada. Qualifications and experience on application. 3824 Goodchild Advertising, 114 Holborn, London E.C. 1, England.

patents . . .

INVENTOR'S RECORD, Patent Information Booklet free on request. Franklin W. Durgin, Registered Patent Agent, 12500 Meadowood Drive, Silver Spring, Maryland.

business opportunities . . .

High pressure system for which patent rights have been claimed, of new design combining important advantages in comparison with the present system, shall be manufactured on a licencee basis in America. Interested firms please address Key 1289A, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2, Ill.

situations open . . .

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VARIETY OF PUBLIC WORKS PROGRAMS

Junior Engineer (Mechanical) $460-$530
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PIPING & AIR CONDITIONING DESIGNERS & DRAFTSMEN

Long established firm of consulting engineers with world-wide practice needs piping and air conditioning designers and draftsmen for work on hydro powerplants. Five years experience preferred. Permanent positions. Liberal employee benefits. Starting salaries dependent on qualifications. Please send complete resume to Personnel Department HARZA ENGINEERING COMPANY 400 West Madison Street, Chicago 6, Illinois.

Design . . . Research . . . Development ENGINEER

Permanent position available with long-established nationally-known firm in *Heating . . . Ventilating . . . Air Conditioning*
Send resume, in confidence, or phone Mr. Morgan (WOodlawn 4-4600)

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Sales Engineer

Air Conditioning — Refrigeration

Opportunity and interesting work calling on contractors, wholesalers and manufacturers of air conditioning and refrigeration equipment.

Several openings available for the technical graduate or equivalent who has previous experience in the industry and who is between 25 and 32 years of age.

Starting salary based on experience with an incentive system after indoctrination period. All replies will be kept confidential. Send your resume under personal cover to W. H. Krack, c/o **Sporlan Valve Co., St. Louis 17, Mo.**

MECHANICAL ENGINEERS

Our company is in business forty years. We have the foremost, progressive organization in our line in the East. Continuing growth has created a need for additional personnel in several departments.

We are Sheet Metal Contractors and Manufacturers specializing in the design, fabrication, installation of warm air heating, ventilating, air conditioning and exhaust systems. We also manufacture all types of sheet metal specialties. Our operation generally covers a radius of 500 miles from New York City, and includes all types of buildings, structures, ships, etc.

We are offering permanent positions with opportunity for advancement. Situations are available for *experienced and trainee* engineers in the following categories:

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SHEET METAL ESTIMATING
SALES

PROJECT DESIGN
RESEARCH & DEVELOPMENT
TESTING

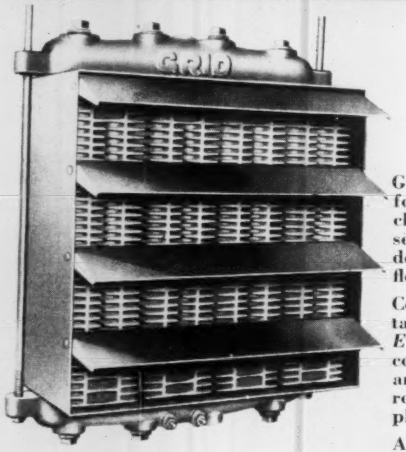
We require intelligent, ambitious and industrious men. Salary is commensurate with experience, ability and accomplishment. Health and Insurance benefits, cooperative educational program, etc. Send complete resume of education background and experience. P. O. Box 73, New Hyde Park, Long Island, New York.

GRID

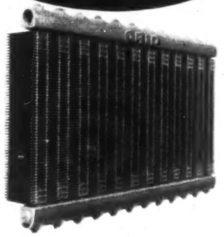
CAST IRON STEAM HEAT TRANSFER SURFACE

UNIT HEATERS
BLAST HEATERS
RADIATORS

. . . one piece construction high test cast iron heating sections . . .



Trouble-free heating service since 1929

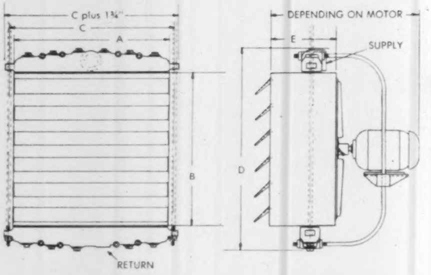


GRID design gives you maximum heating performance because — GRID provides more air changes at lower outlet temperatures . . . carefully selected motor speeds and fan capacities positively deliver warm, comfortable air in ample volume to floor level . . . no wasted heat through stratification.

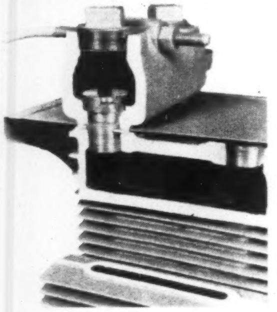
Corrosion in unit heaters — external, from contaminated air . . . internal, from electrolytic action *ENDS* — when your unit heaters are GRID cast iron construction. Here's why — GRID heating sections are made of high-test cast iron . . . no external corrosion from acid or other fumes present in many plants.

All metals in contact with steam are similar . . . no electrolytic action internally . . . no internal corrosion.

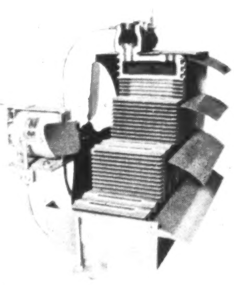
GRID CAST IRON CONSTRUCTION ENDS UNIT HEATER MAINTENANCE PROBLEMS



Overall dimensions for installation of Cast Iron GRID Unit Heater



GRID construction ends your unit heater maintenance problems — because GRID will operate on steam pressures up to 250 P.S.I. . . . 450° temperature . . . no pressure-reducing valves needed. No soldered, brazed, welded or expanded connections . . . a specially designed threaded nipple provides a leak proof joint (see illustration).



CI (CAST IRON) SERIES GRID UNIT HEATER DATA

Capacities at 60° F ENT Air 5 P.S.I. Steam

Model No.	Dimensions A	B	C	D	E	Motor HP	RPM	Fan Vol.	Btu Hr	Final Temp °F	Pipe Size Supply	Return	Support Rod Dia	Approx. Net Shpg Weight
CI 1000	11¾	9¾	12¼	9⅞	15⅞	1/20	1550	570	29100	106	1¼	1¼	⅜	150
CI 1200	15	13	12¾	12⅞	18⅝	1/12	1750	800	45490	112	1¼	1¼	⅜	210
CI 1500	17¼	15⅜	12	16	24⅜	1/8	1750	1500	76650	106	1½	1½	½	280
CI 1520	17¼	15⅜	12	21	29⅜	1/8	1750	1700	101570	114	1½	1½	½	390
CI 2000	22⅜	20½	12	21	29⅜	1/6	1150	2600	140700	109	2	1½	½	490
CI 2025	22⅜	20½	12	26	34	1/6	1150	2875	172100	114	2	1½	½	520
CI 2504	27½	25¾	13	26	35⅜	1/4	1150	3300	205800	117	2	1½	⅝	660
CI 2500	27½	25¾	13	26	35⅜	1/2	1150	4350	223130	106	2	1½	⅝	700
CI 2530	27½	25¾	13	31	40⅜	1/2	1150	4650	275630	114	2	1½	⅝	900
CI 3000	32⅝	30⅞	13	31	40⅜	1/2	850	5900	320250	109	2½	1½	¾	1020
CI 3000	32⅝	30⅞	13	31	40⅜	1½	1150	8000	380100	103	2½	1½	¾	1070

OFFICES IN PRINCIPAL CITIES

D. J. MURRAY MANUFACTURING CO.

WAUSAU, WISCONSIN

Write for complete catalog information on GRID Unit Heaters, GRID Blast Heaters, and GRID Radiation.

T.M. REG. U.S. PAT. OFF.

1957 DIRECTORY

Heating, Piping and Air Conditioning Equipment for Industrial, Commercial, Institutional and Public Buildings

PART 1—Products Advertised In This Issue—Page 3d

For the names of the manufacturers of products advertised in this issue, look in Part 1, where the advertised products are classified in "directory style" with the noun governing. For the pages on which you will find the advertising of manufacturers in this issue, see the following page of this yellow Directory Section, page 2d.

PART 2—All Products Classified—Page 11d

If you want to know the names of one or more manufacturers making a certain product, look in Part 2, where all products are classified alphabetically in "directory style" with the noun governing (for instance, "unit heaters" are listed under "heaters, unit").

PART 3—All Trade Names—Page 113d

If you have the trade name of a product and want to know who manufactures it, look in Part 3, where trade names are alphabetically listed. Trade names the same as or identifiable from the company name are not listed. Manufacturers with such trade names can be easily identified under their product classifications in Parts 1 and 2.

PART 4—All Manufacturers' Addresses—Page 133d

For the complete name and address of any manufacturer, look in Part 4.

Heating, Piping & Air Conditioning
6 N. Michigan Ave.
Chicago 2, Illinois

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HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRIAL AND ALL OTHER LARGE BUILDINGS

PART 1—PRODUCTS ADVERTISED IN THIS ISSUE

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ABSORBERS, VIBRATION, FOR REFRIGERANT AND OTHER PIPE LINES
American Metal Hose Div., American Brass Co.

ADHESIVES, FOR INSULATION OTHER THAN PIPE
Grant Wilson, Inc.

ADHESIVES, FOR PIPE COVERING
Armstrong Cork Co.
Grant Wilson, Inc.
Swift & Co., Adhesive Products Dept.

ADSORBERS, ODOR
Barnebey-Cheney Co.

ADSORBERS, SHOCK, LIQUID, TO ELIMINATE WATER HAMMER IN PIPING
American Metal Hose Div., American Brass Co.
Josam Mfg. Co.

ALARMS, HIGH & LOW BOILER WATER
McDonnell & Miller, Inc.

ALARMS, LIQUID LEVEL, AUDIBLE
Petrometer Corp.

ALARMS, SMOKE
Heat-Timer Corp.

BEARINGS, BALL
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co.

BEARINGS, PILLOW BLOCK
Dodge Mfg. Corp.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co.

BEARINGS, SLEEVE
Dodge Mfg. Corp.

BELLOWS, THERMOSTATIC AND METALLIC
American Boa, Inc.
Flexonics Corp.

BELTS, V
United States Rubber Co.

BENDERS, PIPE
Greenlee Tool Co., Div. of Greenlee Bros. & Co.

BENDERS, TUBING
Greenlee Tool Co., Div. of Greenlee Bros. & Co.

BENDS, EXPANSION, STEAM PIPE
Grinnell Co., Inc.

BLADES, PROPELLER FAN
Torrington Mfg. Co., The

BLOWERS, HIGH PRESSURE
American Blower Corp.
Barry Blower Co.
Clarage Fan Co.
General Blower Co.
Ingersoll-Rand Co.
Peerless Electric Co.

BOARDS, PANEL AND CONTROL
Powers Regulator Co.

BOILERS, HEATING, CAST IRON, SECTIONAL
Smith, Inc., H. B., The

BOILERS, HEATING, STEEL, FIRE TUBE
Ames Iron Works, Inc.
Fitzgibbons Boiler Co., Inc.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp.
Mt. Hawley Mfg. Co., Inc.
National-U.S. Radiator Corp., The
Pacific Steel Boiler Div., National-U.S. Radiator Corp.
Titusville Iron Wks. Co., The

BOILERS, HEATING, STEEL, WATER TUBE
Babcock & Wilcox Co., The, Boiler Div.
Combustion Engineering Inc.
Nebraska Boiler Co., Inc.
Rite Engineering & Mfg. Corp.
Titusville Iron Wks. Co., The

BOILERS, PACKAGED UNITS, HEATING AND PROCESS — Including Controls, Feed Pump, etc.
Boiler Engineering & Supply Co.
Cleaver-Brooks Co.
Combustion Engineering Inc.
Fitzgibbons Boiler Co., Inc.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp.
Nebraska Boiler Co., Inc.
Pacific Steel Boiler Div., National-U.S. Radiator Corp.
Petro
Rite Engineering & Mfg. Corp.
Titusville Iron Wks. Co., The

BREAKERS, VACUUM FOR STEAM-USING EQUIPMENT
Foster Engineering Co.

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL
Gordon & Piatt, Inc.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co.
Petro
Synchronous Flame, Inc.

BURNERS, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL
Best Combustion Equipment Co., Inc., W.N.
Petro
Synchronous Flame, Inc.
Webster Engineering Co.

BURNERS, OIL, COMMERCIAL AND INDUSTRIAL
Best Combustion Equipment Co., Inc., W.N.
Cleaver-Brooks Co.
Petro
Synchronous Flame, Inc.

BURNERS, PULVERIZED COAL, COMMERCIAL & INDUSTRIAL
Babcock & Wilcox Co., The, Boiler Div.
Combustion Engineering Inc.

CEMENT & COMPOUNDS, PIPE JOINT
W-K-M Mfg. Co., Div. of ACF Industries, Inc.

CHANGERS, SPEED, MAGNETIC
Electro-Dynamic Div. of General Dynamics Corp.

CHILLERS, WATER, FOR AIR CONDITIONING AND REFRIGERATION
Acme Industries, Inc.
Bell & Gossett Co.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.
Kennard Corp.
Kritzer Radiant Coils, Inc.
Patterson-Kelley Co., Inc.
Vilter Mfg. Co., The
Whitlock Mfg. Co.

CIRCULATORS FOR HOT WATER HEATING SYSTEMS
Bell & Gossett Co.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp.
Dunham-Bush, Inc.
Taco Heaters, Inc.

CLAMPS, BEAM, PIPE HANGING
Carpenter & Paterson, Inc.
Grinnell Co., Inc.

CLAMPS, PIPE, WELDING
Jewel Mfg. Co.

COATINGS, PROTECTIVE, FOR METALS
Goodall Rubber Co.
Novelty Steam Boiler Wks., Inc.
Pittsburgh Plate Glass Co.
Tapecoat Co., The

COILS, FOR HOT WATER STORAGE TANKS
Richmond Engineering Co.

COILS, PIPE
Grinnell Co., Inc.
Vilter Mfg. Co., The

COLLECTORS, DUST
American Air Filter Co., Inc.

COMPRESSORS, AIR
Ingersoll-Rand Co.
Joy Mfg. Co.

COMPRESSORS, REFRIGERATING, CENTRIFUGAL
American Blower Corp.
Carrier Corp.
Trane Co., The

COMPRESSORS, REFRIGERATING, COMBINED WITH CONDENSER, WATER CHILLER, PIPING CONNECTIONS, AND CONTROLS
Acme Industries, Inc.
Bell & Gossett Co.
Carrier Corp.
Heat-X, Inc.

COMPRESSORS, REFRIGERATING, RECIPROCATING
Bendix-Westinghouse, Automotive Air Brake Co.
Copeland Refrigeration Corp.
Frick Co.
Trane Co., The
Vilter Mfg. Co., The

COMPRESSORS, REFRIGERATING, STEAM JET
Wheeler Mfg. Co., C. H.

CONCRETE, INSULATING, FOR UNDERGROUND PIPING
Ziegler & Co., G. S.
Zonolite Co.

CONDENSERS, REFRIGERATING, AIR COOLED
Bohn Aluminum & Brass Corp., Betz Div.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.

CONDENSERS, REFRIGERATING, EVAPORATIVE
Acme Industries, Inc.
Airtemp Construction, Div. of Chrysler Corp.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.
Governair Corp.
Kennard Corp.
Marlo Coil Co.
Trane Co., The
Vilter Mfg. Co., The

CONDENSERS, REFRIGERATING, SHELL AND COIL
Acme Industries, Inc.
Bell & Gossett Co.
Patterson-Kelley Co., Inc.
Vilter Mfg. Co., The

CONDENSERS, REFRIGERATING, SHELL AND TUBE
Acme Industries, Inc.
Bell & Gossett Co.
Halstead & Mitchell
Ingersoll-Rand Co.
Patterson-Kelley Co., Inc.
Vilter Mfg. Co., The

CONDUIT, UNDERGROUND PIPING
Durant Insulated Pipe Co.
Porter & Co., Inc., H. W.
Ric-wiL, Inc.

CONNECTIONS, DUCT, FLEXIBLE
Elgen Mfg. Co.
Flexaust Co.

CONTROL, FOR INDIRECT WATER HEATERS
Barber-Colman Co.
Powers Regulator Co.

CONTROL SYSTEMS, PRE-ASSEMBLED AS UNITS, FOR HEATING, COOLING, AND VENTILATING
Barber-Colman Co.
Heat-Timer Corp.

CONTROLLERS AND STARTERS, MOTOR
Allen-Bradley Co.
Furnas Electric Co.

CONTROLS, FIRE PROTECTION SPRINKLER SYSTEMS
Allen Mfg. Co., W. D.
Grinnell Co., Inc.

CONTROLS, FLAME FAILURE
General Controls Co.
Minneapolis-Honeywell Regulator Co.

CONVERTORS, STEAM
Novelty Steam Boiler Wks., Inc.
Patterson-Kelley Co., Inc.
Richmond Engineering Co.

COOLERS, UNIT
Bohn Aluminum & Brass Corp., Betz Div.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.
Governair Corp.
Vilter Mfg. Co., The

COUPLINGS, PIPE
Capitol Mfg. & Supply Co.
Gustin-Bacon Mfg. Co.

CUT-OFFS, LOW WATER, HEATING BOILER
McDonnell & Miller, Inc.

CUTTERS, TUBING
Reed Mfg. Co.

DAMPERS, AIR, BACK DRAFT
Jenn-Air Products Co.

DAMPERS, DIFFUSERS
Air Control Products, Inc.

DAMPERS, DUCT, MANUALLY OPERATED
Air & Refrigeration Corp.
Titus Mfg. Corp.
Waterloo Register Co., Inc.

DAMPERS, DUCT, REMOTE CONTROLLED
Air & Refrigeration Corp.

DEHUMIDIFIERS, ABSORPTION AND ADSORPTION
Niagara Blower Co.

DEHUMIDIFIERS FOR COMPRESSED AIR
Pritchard & Co. of California, J. F.

DEHUMIDIFIERS, SPRAYED COIL
Air & Refrigeration Corp.
Clarage Fan Co.

DEHYDRATORS, REFRIGERANT
Henry Valve Co.
Sporlan Valve Co.

DIFFUSERS, AIR, BASEBOARD
Air Control Products, Inc.
Kritzer Radiant Coils, Inc.
Titus Mfg. Corp.

DIFFUSERS, AIR, CEILING
A-J Mfg. Co.
Air Control Products, Inc.
Air Devices, Inc.
Air Distribution Products Co.
Anemostat Corp. of America
Barber-Colman Co.
Titus Mfg. Corp.
Universal Diffuser Corp.

DIFFUSERS, AIR, FLOOR
A-J Mfg. Co.
Air Control Products, Inc.
Air Devices, Inc.
Anemostat Corp. of America

DIFFUSERS, AIR, HIGH PRESSURE
Air Devices, Inc.
Anemostat Corp. of America
Barber-Colman Co.
Titus Mfg. Corp.
Universal Diffuser Corp.

DIFFUSERS, AIR, WALL
A-J Mfg. Co.
Air Control Products, Inc.
Air Devices, Inc.
Air Distribution Products Co.
Anemostat Corp. of America
Barber-Colman Co.
Titus Mfg. Corp.
Universal Diffuser Corp.

DOORS & PANELS, ACCESS
Air & Refrigeration Corp.

DRILLS, ELECTRIC AND PNEUMATIC, PORTABLE
Ingersoll-Rand Co.
Thor Power Tool Co.

DRYERS, INDUSTRIAL
Air & Refrigeration Corp.
Combustion Engineering Inc.

DUCTS AND DUCT FITTINGS, PREFABRICATED, FLEXIBLE, NON-METALLIC
Flexaust Co.
Flexible Tubing Corp.

ECONOMIZERS, FUEL
Richmond Engineering Co.

EJECTORS, SEWAGE
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp.

ELBOWS AND TEES, BALANCING, FOR HOT WATER HEATING AND CHILLED WATER SYSTEMS
Sarcotherm Controls, Inc.

ELIMINATORS, AIR, FOR HEATING AND PIPING SYSTEMS
Domestic Pump & Mfg. Corp.
Heat-Timer Corp.
Hoffman Specialty Mfg. Corp.
Marsh Heating Equipment Co.

ENGINES, GAS, FOR FAN, PUMP, AND COMPRESSOR DRIVES
LeRoi Div., Westinghouse Air Brake Co.

EVAPORATORS
Bell & Gossett Co.

EXCHANGERS, HEAT
Acme Industries, Inc.
Bell & Gossett Co.
Davis Engineering Corp.
Novelty Steam Boiler Wks., Inc.
Marlo Coil Co.
Richmond Engineering Co.
Rite Engineering & Mfg. Corp.
Trane Co., The
Young Radiator Co.

EXHAUSTERS, BLOWER FAN, WITH SOUND ABSORBING SILENCERS
Nesbitt, Inc., John J.

EXHAUSTERS, WELDING FUME
General Blower Co.

FANS, AXIAL FLOW, PRESSURE TYPE
Air Moving & Conditioning Association, Inc.
Joy Mfg. Co.
Propellair Div., Robbins & Myers, Inc.
South Bend Air Products, Inc.

FANS, CENTRIFUGAL
Air Moving & Conditioning Association, Inc.

Aladdin Heating Corp.
American Air Filter Co., Inc., Herman Nelson Products
American Blower Corp.
Barry Blower Co.
Bishop & Babcock Mfg. Co.
Buffalo Forge Co.
Clarage Fan Co.
General Blower Co.
Lau Blower Co.
Morrison Products, Inc.
New York Blower Co.
Peerless Electric Co.
Trane Co., The
Utility Fan Corp., Div. of Utility Appliance Corp.

FANS, MATERIALS HANDLING

Clarage Fan Co.
General Blower Co.
New York Blower Co.
Peerless Electric Co.

FANS, MECHANICAL DRAFT, FOR BOILERS

Clarage Fan Co.
DeBothezat Fans Div., American Machine & Metals, Inc.
Quickdraft Co.
Pacific Steel Boiler Div., National-U.S. Radiator Corp.
Wing Mfg. Co., L. J.

FANS, PROPELLER

Air Moving & Conditioning Association, Inc.
Allen Cooler & Ventilator, Inc.
American Air Filter Co., Inc., Herman Nelson Products
Clarage Fan Co.
General Blower Co.
New York Blower Co.
Peerless Electric Co.
Propellair Div., Robbins & Myers, Inc.
South Bend Air Products, Inc.

FASTENERS, INSULATION

Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp.

FASTENERS, POWDER OPERATED

Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp.

FEEDERS, WATER, HEATING BOILER

McDonnell & Miller, Inc.

FILTERS, AIR, AUTOMATIC, DRY

American Air Filter Co., Inc.
Green Fuel Economizer Co., The

FILTERS, AIR, AUTOMATIC, VISCOUS

American Air Filter Co., Inc.
Continental Air Filters, Inc.
Farr Co.

FILTERS, AIR, ELECTROSTATIC

American Air Filter Co., Inc.
Electro-Air Cleaner Co.

FILTERS, AIR, GREASE

Air Devices, Inc.
Continental Air Filters, Inc.
Farr Co.
Research Products Corp.

FILTERS, AIR, PANEL, DRY

American Air Filter Co., Inc.
Barnebey-Cheney Co.
Cambridge Filter Corp.
Continental Air Filters, Inc.
Farr Co.
Research Products Corp.

FILTERS, AIR, PANEL, VISCOUS

Air Devices, Inc.
American Air Filter Co., Inc.
Continental Air Filters, Inc.
Evans Corp., George, The
Research Products Corp.

FILTERS, AIR, UNIT, CLEANABLE

Carey Electronic Engineering Co.

FILTERS, AIR, UNIT, THROW-AWAY

American Air Filter Co., Inc.
Cambridge Filter Corp.
Flanders Mill, Inc.
Pittsburgh Plate Glass Co.
Research Products Corp.

FILTERS, REFRIGERANT

Sporlan Valve Co.

FITTINGS, HOSE TO PIPE

Allen Mfg. Co., W. D.

FITTINGS, PIPE

Henry Valve Co.
W-S Fittings Div., H. K. Porter Co., Inc.

FITTINGS, PIPE, CAST IRON

Grinnell Co., Inc.

FITTINGS, PIPE, PLASTIC

American Hard Rubber Co.
Colonial Plastics Mfg. Co.

FITTINGS, PIPE, STEEL

Capitol Mfg. & Supply Co.

FITTINGS, PIPE, STEEL, SOCKET WELD

Bonney Forge & Tool Wks.

FITTINGS, PIPE, WELDING

Babcock & Wilcox Co., The, Tubular Products Div.
Bonney Forge & Tool Wks.
Grinnell Co., Inc.
Midwest Piping Co., Inc.
Tube Turns, A Div. of National Cylinder Gas Co.

FITTINGS, REFRIGERATION

Henry Valve Co.
Vilter Mfg. Co., The

FLANGES, PIPE

Babcock & Wilcox Co., The, Tubular Products Div.
Henry Valve Co.
Ritter Pattern & Casting Co., Inc.
Tube Turns, A Div. of National Cylinder Gas Co.

FURNACES, WARM AIR, FOR INDUSTRIAL AND LARGE BUILDING CENTRAL HEATING

Campbell Heating Co.
Hayes Furnace Mfg. & Supply Co.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.
National Heater Co.

GAGE SETS, REFRIGERATION

Henry Valve Co.

GAGES, INDICATING, DRAFT

General Controls Co.

GAGES, INDICATING, PRESSURE

Marsh Heating Equipment Co.

GAGES, INDICATING, VACUUM

Moeller Instrument Co.

GAGES, LIQUID LEVEL

Henry Valve Co.
Petrometer Corp.

GAGES, OIL TANK

Petrometer Corp.

GAGES, PRESSURE

Weksler Thermometer Corp.

GEAR-MOTORS

Electro-Dynamic Div. of General Dynamics Corp.

GOVERNORS, PUMP

Davis Regulator Co.
Foster Engineering Co.

GRILLES

A-J Mfg. Co.
Air Control Products, Inc.
Barber-Colman Co.
Diamond Mfg. Co.
Hendrick Mfg. Co.
Independent Register Co.
Titus Mfg. Corp.
Waterloo Register Co., Inc.

HANGERS AND SUPPORTS, PIPE

Carpenter & Paterson, Inc.
Fee & Mason Mfg. Co., Inc.
Grinnell Co., Inc.
Ritter Pattern & Casting Co., Inc.

HANGERS OR BRACKETS, RADIATOR

Carpenter & Paterson, Inc.

HEADERS, PIPE, WELDED

Grinnell Co., Inc.

HEADS, SPRINKLER, FOR FIRE PROTECTION

Grinnell Co., Inc.

HEATERS, AIR, DIRECT FIRED, COAL

Campbell Heating Co.

HEATERS, AIR, DIRECT FIRED, COMBINATION GAS AND OIL

Airtherm Mfg. Co.
National Heater Co.
Olson & Co., Arthur A.
Prat-Daniel Corp., Thermobloc Div.

HEATERS, AIR, DIRECT FIRED, GAS, CENTRIFUGAL FAN TYPE

Airtherm Mfg. Co.
Campbell Heating Co.
Carrier Corp.
Hayes Furnace Mfg. & Supply Co.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.
National Heater Co.
Olson & Co., Arthur A.
Prat-Daniel Corp., Thermobloc Div.

HEATERS, AIR, DIRECT FIRED, OIL, FLOOR TYPE

Airtherm Mfg. Co.
Campbell Heating Co.
Carrier Corp.
National Heater Co.
Olson & Co., Arthur A.
Prat-Daniel Corp., Thermobloc Div.

HEATERS, AIR, DIRECT FIRED, OIL, PORTABLE FOR SPACE HEATING

National Heater Co.

HEATERS, AIR, DIRECT FIRED, OIL, SUSPENDED TYPE

National Heater Co.

HEATERS, DUCT, GAS

Campbell Heating Co.
Hayes Furnace Mfg. & Supply Co.
Reznor Mfg. Co.

HEATERS, DUCT, OIL FIRED

Campbell Heating Co.

HEATERS, INDIRECT, SUBMERGED

Richmond Engineering Co.

HEATERS, SUSPENDED, RADIANT, GAS FIRED

Prat-Daniel Corp., Thermobloc Div.

HEATERS, UNIT

Air Moving & Conditioning Association, Inc.

HEATERS, UNIT, GAS, PROPELLER FAN TYPE

Airtherm Mfg. Co.
American Air Filter Co., Inc., Herman Nelson Products
Grinnell Co., Inc.
Nesbitt, Inc., John J.
Reznor Mfg. Co.
Wing Mfg. Co., L. J.

HEATERS, UNIT, STEAM AND HOT WATER, CABINET TYPE

Airtherm Mfg. Co.
American Air Filter Co., Inc., Herman Nelson Products
Clarage Fan Co.
Modine Mfg. Co.
Nesbitt, Inc., John J.
Young Radiator Co.

HEATERS, UNIT, STEAM AND HOT WATER, CENTRIFUGAL FAN TYPE

Airtherm Mfg. Co.
American Air Filter Co., Inc., Herman Nelson Products
Buffalo Forge Co.
Clarage Fan Co.
Kennard Corp.
Nesbitt, Inc., John J.
New York Blower Co.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, HORIZONTAL BLOW

Airtherm Mfg. Co.
American Air Filter Co., Inc., Herman Nelson Products
Buffalo Forge Co.
Clarage Fan Co.
Grinnell Co., Inc.
Kritzer Radiant Coils, Inc.
Modine Mfg. Co.
Murray Mfg. Co., D. J.
Nesbitt, Inc., John J.
New York Blower Co.
Wing Mfg. Co., L. J.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, VERTICAL BLOW

Airtherm Mfg. Co.
American Air Filter Co., Inc., Herman Nelson Products
Buffalo Forge Co.
Clarage Fan Co.
Grinnell Co., Inc.
Kritzer Radiant Coils, Inc.
Modine Mfg. Co.
Murray Mfg. Co., D. J.
Nesbitt, Inc., John J.
Wing Mfg. Co., L. J.

HEATERS, WATER, AIR-TANKLESS

General Fittings Co.

HEATERS, WATER, ELECTRIC

Combustion Engineering Inc.

HEATERS, WATER, GAS FIRED

Combustion Engineering Inc.
Pacific Steel Boiler Div., National-U. S. Radiator Corp.

HEATERS, WATER, INDIRECT

General Fittings Co.
Novelty Steam Boiler Wks., Inc.
Patterson-Kelley Co., Inc.
Whitlock Mfg. Co.

HEATERS, WATER, OIL FIRED

Pacific Steel Boiler Div., National-U.S. Radiator Corp.

HEATERS, WATER, STEAM, INSTANTANEOUS

General Fittings Co.
Novelty Steam Boiler Wks., Inc.
Patterson-Kelley Co., Inc.
Richmond Engineering Co.
Whitlock Mfg. Co.

HEATERS, WATER, STEAM, STORAGE

Novelty Steam Boiler Wks., Inc.
Patterson-Kelley Co., Inc.
Richmond Engineering Co.
Whitlock Mfg. Co.

HEATERS, WATER, STEEL, COAL FIRED

Pacific Steel Boiler Div., National-U.S. Radiator Corp.

HOSE, FLEXIBLE, METAL AND FITTINGS

American Metal Hose Div., American Brass Co.
Flexible Tubing Corp.
Flexonics Corp.

HOSE, NON-METAL, AND FITTINGS

Flexaust Co.
Flexonics Corp.

HOUSINGS, FAN, CENTRIFUGAL

Barry Blower Co.
Morrison Products, Inc.
Utility Fan Corp., Div. of Utility Appliance Corp.

HUMIDIFIERS

Grinnell Co., Inc.
Niagara Blower Co.
Research Products Corp.
Spraying Systems Co.

HUMIDISTATS

Powers Regulator Co.

HYGROMETERS

Moeller Instrument Co.
Weksler Thermometer Corp.

INDICATOR-CONTROLLERS, PRESSURE

Weksler Thermometer Corp.

INDICATOR-CONTROLLERS, RELATIVE HUMIDITY

Weksler Thermometer Corp.

INDICATOR-CONTROLLERS, TEMPERATURE

General Controls Co.
Weksler Thermometer Corp.

INDICATORS, DEW POINT

Petrometer Corp.

INDICATORS, LIQUID LEVEL, BOILER AND TANK

Petrometer Corp.

INDICATORS, RELATIVE HUMIDITY

Weksler Thermometer Corp.

INSTRUMENTS, SOLAR SENSING, FOR HEATING AND AIR CONDITIONING CONTROL

Johnson Service Co.
Powers Regulator Co.

INSULATION, BOILER AND TANK

United Cork Companies

INSULATION, BUILDING

Gustin-Bacon Mfg. Co.
Infra Insulation, Inc.
United Cork Companies

INSULATION, DUCT, SOUND DEADENING (FOR APPLICATION INSIDE DUCT)

Gustin-Bacon Mfg. Co.
Industrial Acoustics Co., Inc.

INSULATION, DUCT, THERMAL

Baldwin-Hill Co.
Grant Wilson, Inc.
Gustin-Bacon Mfg. Co.
L. O. F. Glass Fibers Co.

INSULATION, PIPE AND TUBING

American Gilsonite Co.
Armstrong Cork Co.
Durant Insulated Pipe Co.
Gustin-Bacon Mfg. Co.
Keasbey & Mattison Co.
Porter & Co., Inc., H. W.
Ric-wiL, Inc.
Sponge Products Div., B. F. Goodrich Co.
United Cork Companies
Ziegler & Co., G. S.
Zonolite Co.

JOINTS, PIPE, EXPANSION, FOR BASEBOARD HEATING

Flexonics Corp.

JOINTS, PIPE, EXPANSION, PACKLESS, METAL

American Boa, Inc.
American District Steam Div. ADSCO Industries, Inc.
Badger Mfg. Co.
Flexonics Corp.

JOINTS, PIPE, EXPANSION, PACKLESS, RUBBER

Goodall Rubber Co.

JOINTS, PIPE, EXPANSION, SLIP

American District Steam Div. ADSCO Industries, Inc.
Yarnall-Waring Co.

LININGS, TANK

Novelty Steam Boiler Wks., Inc.

LINKS, FUSIBLE

Parish Co., The

LOUVERS AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

Air & Refrigeration Corp.
Swartwout Co., The

MACHINES, REFRIGERATION, ABSORPTION

Carrier Corp.

MANIFOLDS AND HEADERS, PREFABRICATED, FOR HEATING SYSTEMS

Grinnell Co., Inc.

MARKERS, PIPE, HOLE AND SADDLE

Jewel Mfg. Co.

METERS, FLOW, GAS OR AIR

Foster Engineering Co.

METERS, FLOW, STEAM

Foster Engineering Co.

MOTORS, ELECTRIC, FRACTIONAL HP

Century Electric Co.
Lima Electric Motor Co., The
Peerless Electric Co.
Wagner Electric Corp.

MOTORS, ELECTRIC, 1 HP AND OVER

Allis Co., Louis, The
Century Electric Co.
Electro-Dynamic Div. of General Dynamics Corp.
Elliott Co.
Lima Electric Motor Co., The
Peerless Electric Co.
Reliance Electric & Engineering Co.
Wagner Electric Corp.

NOZZLES, FLOW MEASURING

Foster Engineering Co.

NIPPLES, PIPE

Capitol Mfg. & Supply Co.

NOZZLES, ATOMIZING

Binks Mfg. Co.
Monarch Mfg. Works, Inc.
Spraying Systems Co.

NOZZLES, FLOODING

Binks Mfg. Co.

NOZZLES, OIL BURNER

Monarch Mfg. Works, Inc.

NOZZLES, SPRAY

Binks Mfg. Co.
Monarch Mfg. Works, Inc.
Spraying Systems Co.

OILS, FOR COATING VISCOUS AIR FILTERS

Continental Air Filters, Inc.

OPERATORS, DAMPER, DUCT

General Controls Co.
Powers Regulator Co.

OPERATORS, VALVE, HAND OR HYDRAULIC

Babbitt Steam Specialty Co.

PACKING, ASBESTOS

Grant Wilson, Inc.

PANELS, PERFORATED FOR AIR DIFFUSION

Diamond Mfg. Co.

PARTS FOR HEATING AND AIR CONDITIONING EQUIPMENT

Air & Refrigeration Corp.
Alter Co., Harry

PIPE, ASBESTOS FIBER AND CEMENT

Johns-Manville

PIPE, BRASS AND COPPER

Hussey & Co., C. G., Div. of Copper Range Co.
Lewin-Mathes Co., Lewin Metals Div.

PIPE AND FITTINGS, GAS VENT AND FLUE

Johns-Manville

PIPE, JACKETED

Durant Insulated Pipe Co.
Ric-wiL, Inc.

PIPE, NICKEL & NICKEL ALLOY

Babcock & Wilcox Co., The, Tubular Products Div.

PIPE, PLASTIC

American Hard Rubber Co.
Colonial Plastics Mfg. Co.
Goodall Rubber Co.

PIPE, PRE-INSULATED

Durant Insulated Pipe Co.
Ric-wiL, Inc.

PIPE, STEEL

Babcock & Wilcox Co., The, Tubular Products Div.
Committee on Steel Pipe Research, American Iron & Steel Institute
Spang-Chalfant, Div. of The National Supply Co.
Wheatland Tube Co.
Youngstown Sheet & Tube Co.

PIPE, STEEL, BUTT AND LAP WELDED

Bethlehem Steel Co.

PIPE, WROUGHT IRON

Byers Co., A. M.

PLASTICS, POWDERS and RESINS (Basic Materials)

Pittsburgh Plate Glass Co.

PLATES, FLOOR AND CEILING

Ritter Pattern & Casting Co., Inc.

PREHEATERS, FUEL OIL

Davis Engineering Corp.
Manning & Lewis Engineering Co.
Patterson-Kelley Co., Inc.
Whitlock Mfg. Co.

PROTECTORS, PIPE COVERING

Carpenter & Paterson, Inc.

PSYCHROMETERS

Moeller Instrument Co.
Weksler Thermometer Corp.

PUMP-MOTOR UNITS, SELF-CONTAINED

Allis-Chalmers Mfg. Co.
Aurora Pump Div., The New York Air Brake Co.
Goulds Pumps, Inc.
Ingersoll-Rand Co.
Weinman Pump Mfg. Co., The

PUMPS, BOILER FEED

American-Marsh Pumps, Inc.
Eagan Co., Inc., Walter H.
Wheeler Mfg. Co., C. H., Economy Pump Div.

PUMPS, CENTRIFUGAL

Allis-Chalmers Mfg. Co.
American-Marsh Pumps, Inc.
Aurora Pump Div., The New York Air Brake Co.
Bell & Gossett Co.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp.
DeLaval Steam Turbine Co.
Domestic Pump & Mfg. Corp.
Eagan Co., Inc., Walter H.
Goulds Pumps, Inc.
Ingersoll-Rand Co.
McDonald Mfg. Co., A. Y.
Myers & Bro. Co., F. E.
Taco Heaters, Inc.
Weinman Pump Mfg. Co., The

PUMPS, CONDENSATE RETURN

Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp.
Domestic Pump & Mfg. Corp.
Eagan Co., Inc., Walter H.
Hoffman Specialty Mfg. Corp.
Nash Engineering Co.
Skidmore Corp.
Weil Pump Co.
Wheeler Mfg. Co., C. H., Economy Pump Div.

PUMPS, DEEP WELL, TURBINE

Eagan Co., Inc., Walter H.

PUMPS, EVAPORATIVE COOLER

Aurora Pump Div., The New York Air Brake Co.

PUMPS, FIRE

American-Marsh Pump, Inc.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp.

PUMPS, PROPORTIONING

Eagan Co., Inc., Walter H.

PUMPS, RECIPROCATING

Goulds Pumps, Inc.

PUMPS, ROTARY

Goulds Pumps, Inc.
Tuthill Pump Co.

PUMPS, SEWAGE & SLUDGE

Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp.

PUMPS, STEAM

American-Marsh Pumps, Inc.

PUMPS, SUMP

Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp.
Goulds Pumps, Inc.
Skidmore Corp.

PUMPS, TURBINE TYPE

American-Marsh Pumps, Inc.
Eagan Co., Inc., Walter H.

PUMPS, VACUUM

Domestic Pump & Mfg. Corp.
Ingersoll-Rand Co.
Joy Mfg. Co.
Skidmore Corp.

PUMPS, VACUUM HEATING

Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp.
Domestic Pump & Mfg. Corp.
Hoffman Specialty Mfg. Corp.
Nash Engineering Co.
Wheeler Mfg. Co., C. H., Economy Pump Div.

PUMPS, VISCOUS LIQUIDS AND HEAVY MATERIALS

Goulds Pumps, Inc.
Tuthill Pump Co.

RADIATION, BASEBOARD, FERROUS

Kritzer Radiant Coils, Inc.
Slant-Fin Radiator Corp.

RADIATION, BASEBOARD, NON-FERROUS

Embassy Steel Products, Inc.
Nesbitt, Inc., John J.
Shaw-Perkins Mfg. Co.
Slant-Fin Radiator Corp.

RADIATION, CONVECTION TYPE, FERROUS

Kritzer Radiant Coils, Inc.
Murray Mfg. Co., D.J.
Shaw-Perkins Mfg. Co.

RADIATION, CONVECTION TYPE, NON-FERROUS

Airtherm Mfg. Co.
G & O Mfg. Co.
Kritzer Radiant Coils, Inc.
Nesbitt, Inc., John J.
Shaw-Perkins Mfg. Co.

RADIATION, DIRECT

Murray Mfg. Co., D. J.

RADIATION, FIN TUBE TYPE

Drayer-Hanson, Div. of National-U.S. Radiator Corp.
G & O Mfg. Co.
Nesbitt, Inc., John J.
Shaw-Perkins Mfg. Co.
Slant-Fin Radiator Corp.

RADIATORS, HUMIDIFYING

Murray Mfg. Co., D. J.

RECEIVERS

Bell & Gossett Co.

RECEIVERS, REFRIGERANT, LIQUID

Acme Industries, Inc.

RECORDER-CONTROLLERS, COMBINED TEMPERATURE AND HUMIDITY

Weksler Thermometer Corp.

RECORDER-CONTROLLERS, HUMIDITY

Weksler Thermometer Corp.

RECORDER-CONTROLLERS, PRESSURE

Weksler Thermometer Corp.

RECORDER-CONTROLLERS, TEMPERATURE

Weksler Thermometer Corp.

RECORDERS, HUMIDITY

Moeller Instrument Co.
Weksler Thermometer Corp.

RECORDERS, PRESSURE AND VACUUM

Weksler Thermometer Corp.

RECORDERS, TEMPERATURE

Moeller Instrument Co.
Palmer Thermometers, Inc.
Weksler Thermometer Corp.

REFRIGERANTS

du Pont de Nemours & Co., E. I., Kinetic Chemicals Div.
General Chemical Div., Allied Chemical & Dye Corp.

REGISTERS

A-J Mfg. Co.
Air Control Products, Inc.
Barber-Colman Co.

Independent Register Co.
Stewart Mfg. Co., Inc.
Titus Mfg. Corp.
Waterloo Register Co., Inc.

REGULATORS, DAMPER SETS

Elgen Mfg. Co.

REGULATORS, LEVEL, LIQUID

Alco Valve Co.
Davis Regulator Co.

REGULATORS, PRESSURE, AIR

Davis Regulator Co.
Foster Engineering Co.
Powers Regulator Co.

REGULATORS, PRESSURE, GAS

Davis Regulator Co.
Foster Engineering Co.

REGULATORS, PRESSURE, HOT WATER HEATING SYSTEM

Bell & Gossett Co.
Powers Regulator Co.

REGULATORS, PRESSURE, LIQUID

Davis Regulator Co.
Foster Engineering Co.

REGULATORS, STATIC PRESSURE, AIR DUCT

Powers Regulator Co.

REGULATORS, TEMPERATURE

Foster Engineering Co.
Lawler Automatic Controls, Inc.
Powers Regulator Co.
Sarco Co., Inc.
Spencer Thermostat Div., Metals & Controls Corp.
White-Rodgers Co.

REGULATORS, VACUUM

Foster Engineering Co.

RELAYS, ELECTRICAL

Allen-Bradley Co.
Minneapolis-Honeywell Regulator Co.

RINGS, WELDING

Robvon Backing Ring Co.

ROD, BRASS

Lewin-Mathes Co., Lewin Metals Div.

SCOOPS, AIR, FOR DEFLECTING FLOW IN DUCTS

Titus Mfg. Corp.

SHEETS, COPPER

Hussey & Co., C. G., Div. of Copper Range Co.

SHEETS, STEEL, GALVANIZED

Jones & Laughlin Steel Corp.
United States Steel Corp.

SOLENOIDS AND SOLENOID COILS

Allen-Bradley Co.

STOKERS, INDUSTRIAL AND COMMERCIAL

Will-Burt Co., The

STRAINERS, PIPE LINE

Davis Regulator Co.
Henry Valve Co.
Hoffman Specialty Mfg. Corp.
Illinois Engineering Co., Div. of American Air Filter Co., Inc.
Sarco Co., Inc.

STRAINERS, REFRIGERANT, LIQUID LINE

Alco Valve Co.
Henry Valve Co.

SURFACE, FINNED, COOLING, BRINE

Aerofin Corp.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.
G & O Mfg. Co.
Young Radiator Co.

SURFACE, FINNED, COOLING, COLD WATER

Aerofin Corp.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.
Dunham-Bush, Inc.
G & O Mfg. Co.
Governair Corp.
Kennard Corp.
Marlo Coil Co.
Nesbitt, Inc., John J.
New York Blower Co.
Thermal Engineering Corp.
Young Radiator Co.

SURFACE, FINNED, COOLING, DIRECT EXPANSION

Aerofin Corp.
Bohn Aluminum & Brass Corp., Betz Div.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.
G & O Mfg. Co.
Governair Corp.
Kennard Corp.
Marlo Coil Co.
Thermal Engineering Corp.
Young Radiator Co.

SURFACE, FINNED, HEATING, INDIRECT, FERROUS

Drayer-Hanson, Div. of National-U.S. Radiator Corp.
Dunham-Bush, Inc.
Murray Mfg. Co., D. J.
New York Blower Co.

SURFACE, FINNED, HEATING, INDIRECT, NON-FERROUS

Aerofin Corp.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.
Dunham-Bush, Inc.
G & O Mfg. Co.
Governair Corp.
Kennard Corp.
Nesbitt, Inc., John J.
Rempe Co.
Thermal Engineering Corp.
Young Radiator Co.

SWITCHES, ELECTRICAL

Parish Co., The

SWITCHES, FLOAT, REFRIGERATION

Alco Valve Co.

SWITCHES, LIQUID LEVEL

Alco Valve Co.
McDonnell & Miller, Inc.

SWITCHES, PRESSURE AND VACUUM

Furnas Electric Co.

SWITCHES, TIME

Allen-Bradley Co.

SYSTEMS, COMBUSTION CONTROL

General Controls Co.
Heat-Timer Corp.
Minneapolis-Honeywell Regulator Co.

SYSTEMS, FIRE EXTINGUISHING, AND HEAT AND SMOKE DETECTORS

Allen Mfg. Co., W. D.
Grinnell Co., Inc.

SYSTEMS, HEATING, HOT WATER

Webster & Co., Warren

SYSTEMS, HEATING, VACUUM

Webster & Co., Warren

SYSTEMS, HEATING, VAPOR

Webster & Co., Warren

SYSTEMS, HEATING, ZONE CONTROL

Heat-Timer Corp.
SelecTemp Div., Iron Fireman Mfg. Co.
Webster & Co., Warren

SYSTEMS, ROOF SPRAYING (for cooling roofs)

April Showers Co., Inc.
Ruppright's Rotary Roof Cooler
Spraying Systems Co.

TANKS, BLOWOFF

Richmond Engineering Co.

TANKS, EXPANSION, FOR HOT WATER HEATING SYSTEMS

Richmond Engineering Co.

TANKS, PROCESS AND STORAGE

Novelty Steam Boiler Wks., Inc.
Richmond Engineering Co.

TAPE, DUCT, ADHESIVE, FOR SEALING JOINTS

Grant Wilson, Inc.

THERMOMETERS, INDICATING, INDUSTRIAL

Moeller Instrument Co.
Palmer Thermometers, Inc.
Weksler Thermometer Corp.

THERMOMETERS, INDICATING, PIPE SURFACE TEMPERATURE

Illinois Testing Laboratories, Inc.

THERMOMETERS, INDICATING, REMOTE-READING

Illinois Testing Laboratories, Inc.
Moeller Instrument Co.
Weksler Thermometer Corp.

THERMOSTATS, ROOM OR WALL

Barber-Colman Co.
Johnson Service Co.
Powers Regulator Co.
Sarcotherm Controls, Inc.
White-Rodgers Co.

THERMOSTATS, SURFACE

Spencer Thermostat Div., Metals & Controls Corp.

THERMOSTATS, TWO STAGE FOR COOLING

Barber-Colman Co.

THERMOSTATS, TWO STAGE FOR HEATING

Barber-Colman Co.

THERMOSTATS, TWO TEMPERATURE OR DUAL

Barber-Colman Co.

THERMOSTATS, WEATHER COMPENSATING

Heat-Timer Corp.
Johnson Service Co.
Powers Regulator Co.
Sarcotherm Controls, Inc.

TOOLS

Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp.

TOWERS, COOLING, ATMOSPHERIC

Binks Mfg. Co.
Dover Mfg. Co.
Lilie-Hoffmann Cooling Towers, Inc.
Pritchard & Co. of California, J. F.

TOWERS, COOLING, MECHANICAL DRAFT

Acme Industries, Inc.
Binks Mfg. Co.
Bohn Aluminum & Brass Corp., Betz Div.
Dover Mfg. Co.

Drayer-Hanson, Div. of National-U.S. Radiator Corp.
Governair Corp.
Halstead & Mitchell
Kennard Corp.
Lilie-Hoffmann Cooling Towers, Inc.
Phillips Cooling Tower Co., Inc.
Pritchard & Co. of California, J. F.

TRANSFORMERS, ELECTRICAL

Wagner Electric Corp.

TRAPS, STEAM, FLOAT-THERMOSTATIC

Hoffman Specialty Mfg. Corp.
Illinois Engineering Co., Div. of American Filter Co., Inc.
Marsh Heating Equipment Co.
Sarco Co., Inc.

TRAPS, STEAM, MECHANICAL

Anderson Co., V. D., The
Armstrong Machine Works
Crane Co.
Hoffman Specialty Mfg. Corp.
Illinois Engineering Co., Div. of American Air Filter Co., Inc.
Marsh Heating Equipment Co.
Sarco Co., Inc.
Sterling Engineering & Mfg. Corp.

TRAPS, STEAM, MECHANICAL, LIFT

Sterling Engineering & Mfg. Corp.

TRAPS, STEAM, THERMOSTATIC

Anderson Co., V. D., The
Hoffman Specialty Mfg. Corp.
Illinois Engineering Co., Div. of American Air Filter Co., Inc.
Sarco Co., Inc.
Sterling Engineering & Mfg. Corp.

TUBING, ALUMINUM

Wolverine Tube, Div. of Calumet and Hecla, Inc.

TUBING, BRASS AND COPPER

American Brass Co.
Hussey & Co., C. G., Div. of Copper Range Co.
Lewin-Mathes Co., Lewin Metals Div.
Reading Tube Corp.
Wolverine Tube, Div. of Calumet and Hecla, Inc.

TUBING, COPPER

Lewin-Mathes Co., Lewin Metals Div.

TUBING, FINNED

G & O Mfg. Co.
Wolverine Tube Div. of Calumet & Hecla, Inc.

TUBING, METAL, FLEXIBLE

American Metal Hose Div., American Brass Co.

TUBING, NICKEL & NICKEL ALLOY

Babcock & Wilcox Co., The, Tubular Products Div.
Wolverine Tube Div. of Calumet & Hecla, Inc.

TUBING, STEEL, ALLOY, SEAMLESS

Babcock & Wilcox Co., The, Tubular Products Co.

TUBING, STEEL, BRAZED

Wolverine Tube Div. of Calumet & Hecla, Inc.

TUBING, STEEL, WELDED

Babcock & Wilcox Co., The, Tubular Products Div.

TURBINES, MECHANICAL DRIVE

Wing Mfg. Co., L. J.

UNIONS, MALLEABLE, BRASS SEAT

Fairbanks Co., The

UNIONS, STEEL

Capitol Mfg. & Supply Co.
Fairbanks Co., The

UNITS, AIR CONDITIONING, CENTRAL STATION TYPE

Air Moving & Conditioning Association, Inc.
Airtemp Construction, Div. of Chrysler Corp.
American Air Filter Co., Inc., Herman Nelson Products
American Blower Corp.
Bohn Aluminum & Brass Corp., Betz Div.
Buffalo Forge Co.
Clarage Fan Co.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.
Dunham-Bush, Inc.
Governair Corp.
Kennard Corp.
Marlo Coil Co.
Nesbitt, Inc., John J.
Niagara Blower Co.
Refrigeration Engineering, Inc.
Thermal Engineering Corp.
Trane Co., The
Vilter Mfg. Co., The
Young Radiator Co.

UNITS, AIR CONDITIONING, HORIZONTAL PACKAGE TYPE

American Blower Corp.
Buffalo Forge Co.
Clarage Fan Co.
Drayer-Hanson, Div. of National-U.S. Radiator Corp.
Dunham-Bush, Inc.
General Electric Co., Commercial & Industrial Air Conditioning Dept.
International Mfg. Co.
Kennard Corp.
Nesbitt, Inc., John J.
Refrigeration Engineering, Inc.
Thermal Engineering Corp.
Vilter Mfg. Co., The

UNITS, AIR CONDITIONING, INDUSTRIAL TYPE

American Air Filter Co., Inc., Herman Nelson Products
Buffalo Forge Co.
Clarage Fan Co.
Dunham-Bush, Inc.
Governair Corp.
Kennard Corp.
Niagara Blower Co.
Refrigeration Engineering, Inc.
Thermal Engineering Corp.
Trane Co., The
Vilter Mfg. Co., The
Young Radiator Co.

UNITS, AIR CONDITIONING, REVERSE REFRIGERATION CYCLE

Acme Industries, Inc.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER

Acme Industries, Inc.
Modine Mfg. Co.
Young Radiator Co.

UNITS, AIR CONDITIONING, SUMMER, STORE TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, 3 HP AND OVER

Airtemp Construction, Div. of Chrysler Corp.
American Blower Corp.
General Electric Co., Commercial & Industrial Air Conditioning Dept.
Trane Co., The

UNITS, AIR CONDITIONING, SUMMER, WALL TYPE, SELF-CONTAINED, FOR MOUNTING THROUGH WALL ONLY

Airtemp Construction, Div. of Chrysler Corp.

UNITS, AIR CONDITIONING, WINTER, ROOM TYPE, FLOOR CABINET (Self Contained blower, filter, heating coil, humidifier)

Buffalo Forge Co.

UNITS, AIR CONDITIONING, YEAR AROUND, FAN-COIL TYPE, FOR INSTALLATION WITH OR WITHOUT CABINET IN ROOM, OR IN CLOSET SPACE OVER CORRIDOR, etc.

Dunham-Bush, Inc.
International Mfg. Co.
Kritzer Radiant Coils, Inc.
Refrigeration Engineering, Inc.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET

Acme Industries, Inc.
Airtherm Mfg. Co.
American Air Filter Co., Inc., Herman Nelson Products
Buffalo Forge Co.
Dunham-Bush, Inc.
Kritzer Radiant Coils, Inc.
Modine Mfg. Co.
SelecTemp Div., Iron Fireman Mfg. Co.
Webster & Co., Warren
Young Radiator Co.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET, INDUCTION

American Blower Corp.

UNITS, FUEL OIL, HEATING, PUMPING AND STRAINING

Eagan Co., Inc., Walter H.
Petro
Tuthill Pump Co.

UNITS, MIXING, SOUND AND VOLUME CONTROL, FOR DOUBLE DUCT HIGH VELOCITY AIR CONDITIONING SYSTEMS

Anemostat Corp. of America
Buensod-Stacey, Inc.

VALVES, ALTITUDE

Foster Engineering Co.

VALVES AND FITTINGS (General)

Crane Co.
Fairbanks Co., The

VALVES, AIR OPERATING

Powers Regulator Co.

VALVES, ANGLE

Everlasting Valve Co.

VALVES, AUTOMATIC STOP AND CHECK

Foster Engineering Co.

VALVES, BACK PRESSURE

Davis Regulator Co.
Foster Engineering Co.

VALVES, BLOW-OFF

Everlasting Valve Co.

VALVES, CHECK

Foster Engineering Co.
Henry Valve Co.
Miller Valve Co., Inc.

VALVES, DIAPHRAGM

American Hard Rubber Co.
Foster Engineering Co.
Henry Valve Co.

VALVES, FIRE PROTECTION, SPRINKLER SYSTEM CONTROL

Grinnell Co., Inc.

VALVES, FLOAT

Alco Valve Co.
Foster Engineering Co.
Maid-O'-Mist, Inc.
Robert Mfg. Co.

VALVES, FLOAT AND LEVER BALANCED

Foster Engineering Co.

VALVES, FLOW CONTROL, FOR HOT WATER HEATING SYSTEMS

Bell & Gossett Co.

VALVES, GATE, ALLOY

Jenkins Bros.
Powell Co., Wm., The
Walworth Co.

VALVES, GATE, BRASS AND BRONZE
Fairbanks Co., The
Jenkins Bros.
Ohio Brass Co.
Ohio Injector Co.
Powell Co., Wm., The
Walworth Co.

VALVES, GATE, IRON BODY
Powell Co., Wm., The
Walworth Co.

VALVES, GATE, MALLEABLE IRON
Powell Co., Wm., The

VALVES, GATE, STEEL
Ohio Injector Co.
Powell Co., Wm., The
Walworth Co.

VALVES, GLOBE, ALLOY
Lunkenheimer Co.
Ohio Injector Co.
Powell Co., Wm., The

VALVES, GLOBE, BRASS AND BRONZE
Grinnell Co., Inc.
Henry Valve Co.
Lunkenheimer Co.
Ohio Brass Co.
Ohio Injector Co.
Powell Co., Wm., The

VALVES, GLOBE, IRON BODY
Henry Valve Co.
Powell Co., Wm., The

VALVES, GLOBE, MALLEABLE IRON
Powell Co., Wm., The

VALVES, GLOBE, STEEL
Henry Valve Co.
Powell Co., Wm., The

VALVES, MIXING, HOT AND COLD WATER, THERMOSTATIC
Lawler Automatic Controls, Inc.

VALVES, MOTOR OPERATED
Barber-Colman Co.
Heat-Timer Corp.

VALVES, NEEDLE
Henry Valve Co.

VALVES, NON-RETURN
Foster Engineering Co.

VALVES, PLASTIC
Colonial Plastics Mfg. Co.

VALVES, PLUG
Homestead Valve Mfg. Co.
Ohio Injector Co.

VALVES, PRESSURE REDUCING & PRESSURE RELIEF, WATER
Bell & Gossett Co.

VALVES, PRESSURE REDUCING AND REGULATING, AIR AND GAS
Davis Regulator Co.
Foster Engineering Co.

VALVES, PRESSURE, REDUCING AND REGULATING; HOT WATER
Bell & Gossett Co.
Davis Regulator Co.
Foster Engineering Co.

VALVES, PRESSURE REDUCING AND REGULATING, LIQUID
Foster Engineering Co.

VALVES, PRESSURE REDUCING AND REGULATING, STEAM
Davis Regulator Co.
Foster Engineering Co.
Hoffman Specialty Mfg. Corp.

VALVES, QUICK OPENING
Everlasting Valve Co.
Jenkins Bros.
Walworth Co.

VALVES, RADIATOR, AIR
Heat-Timer Corp.
Hoffman Specialty Mfg. Corp.
Marsh Heating Equipment Co.

VALVES, RADIATOR, AUTOMATIC, TEMPERATURE CONTROL, PACKLESS
Powers Regulator Co.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF-CONTAINED
Heat-Timer Corp.

VALVES, RADIATOR, STEAM AND HOT WATER, HAND
Hoffman Specialty Mfg. Corp.
Marsh Heating Equipment Co.
Sarcotherm Controls, Inc.

VALVES, RADIATOR, STEAM AND HOT WATER, MODULATING
Marsh Heating Equipment Co.
Sarcotherm Controls, Inc.

VALVES, REFRIGERATION (ANGLE, CHECK, GATE, GLOBE, NEEDLE, RELIEF)
Henry Valve Co.
Vilter Mfg. Co., The

VALVES, REFRIGERATION, BACK PRESSURE
Alco Valve Co.

VALVES, REFRIGERATION, EXPANSION, CONSTANT PRESSURE
Alco Valve Co.

VALVES, REFRIGERATION, EXPANSION, THERMOSTATIC
Alco Valve Co.

VALVES, REFRIGERATION, FLOAT, HIGH PRESSURE
Alco Valve Co.

VALVES, REFRIGERATION, LIQUID CONTROL, FLOAT PILOTED
Alco Valve Co.

VALVES, REFRIGERATION, MAGNETIC STOP
Alco Valve Co.

VALVES, REFRIGERATION, TEMPERATURE & REGULATING OR SNAP ACTION SUCTION
Alco Valve Co.

VALVES, REFRIGERATION, WATER REGULATING, PRESSURE OR TEMPERATURE ACTUATED
Alco Valve Co.

VALVES, RELIEF, HOT WATER, COMBINED PRESSURE AND TEMPERATURE OPERATED
Foster Engineering Co.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED
Bell & Gossett Co.
Davis Regulator Co.
McDonnell & Miller, Inc.

VALVES, RELIEF, HYDRAULIC
Foster Engineering Co.

VALVES, RELIEF, OIL
Davis Regulator Co.
Foster Engineering Co.

VALVES, SADDLE
Walworth Co.

VALVES, SAFETY, STEAM
Foster Engineering Co.

VALVES, SOLDER JOINT
Jenkins Bros.

VALVES, SOLENOID
Alco Valve Co.

VALVES, 2, 3, AND 4 WAY
Henry Valve Co.

VANES, DUCT TURNING, PREFABRICATED
Elgen Mfg. Co.
Titus Mfg. Corp.
Waterloo Register Co., Inc.

VENTILATORS, ROOF, FAN
Air Moving & Conditioning Association, Inc.
Allen Cooler & Ventilator, Inc.
Ammerman Co., Inc.
Clarage Fan Co.
Cook Co., Loren
Gallaher Co., The
Jenn-Air Products Co.
New York Blower Co.
Peerless Electric Co.
Penn Ventilator Co.
Propellair Div., Robbins & Myers, Inc.
Swartwout Co., The

VENTILATORS, ROOF, GRAVITY
Air Devices, Inc.
Allen Cooler & Ventilator, Inc.
Penn Ventilator Co.
Swartwout Co., The

VENTILATORS, ROOF, WITH FUSIBLE LINKS, FOR VENTING PRODUCTS OF COMBUSTION
Swartwout Co., The

VENTILATORS, UNIT
American Air Filter Co., Inc., Herman Nelson Products (hot water, steam, gas, electric heating element)
Nesbitt, Inc., John J.

VENTILATORS, WALL, FAN
Jenn-Air Products Co.

VENTS, RELIEF, AND INTAKES, AIR
Jenn-Air Products Co.

WASHERS, AIR
Air & Refrigeration Corp.
Clarage Fan Co.

WELLS, THERMOMETER
Moeller Instrument Co.

WHEELS, BLOWER
Barry Blower Co.
Lau Blower Co.
Morrison Products, Inc.
Torrington Mfg. Co., The
Utility Fan Corp., Div. of Utility Appliance Corp.

WRENCHES, PIPE
Ridge Tool Co.

DIRECTORY SECTION
HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRIAL AND ALL OTHER LARGE BUILDINGS
PART 2—ALL PRODUCTS CLASSIFIED

For Complete Addresses See Part 4, p. 133d

ABSORBERS, SHOCK, LIQUID, TO ELIMINATE WATER HAMMER IN PIPING

American Metal Hose Div., The American Brass Co., Waterbury, Conn.
Dormont Mfg. Co., Pittsburgh, Pa.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Greer Hydraulics, Inc., Jamaica, N. Y.
Josam Manufacturing Co., Michigan City, Ind.
Packless Metal Hose, Inc., New Rochelle, N. Y.
United Metal Hose Co., Inc., Long Island City, N. Y.
Wade Mfg. Co., Elgin, Ill.
Zurn Mfg. Div., J. A., Zurn Industries, Inc., Erie, Pa.

ABSORBERS, VIBRATION

See Hose, Flexible, Metal and Fittings; Bases and Pads, Vibration Isolating; Connectors, Duct, Flexible

ABSORBERS, VIBRATION, FOR REFRIGERANT AND OTHER PIPE LINES

American Metal Hose Div., The American Brass Co., Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York, N. Y.
Beltran Associates, Inc., Brooklyn, N. Y.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Cobra Metal Hose Div., Chicago, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexonics Corp., Maywood, Ill.
Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Johnson Metal Hose, Inc., Waterbury, Conn.
Korfund Co., Inc., Long Island City, N. Y.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Resistoflex Corp., Roseland, N. J.
Seamlex Co., Inc., Long Island City, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Titeflex, Inc., East Springfield, Mass.
United States Rubber Co., New York, N. Y.
Vibration Mountings, Inc., Corona, N. Y.
Wade Mfg. Co., Elgin, Ill.

ABSORPTION DEHUMIDIFIERS

See Dehumidifiers, Absorption and Adsorption

ABSORPTION REFRIGERATION MACHINES

See Machines, Refrigeration, Absorption

ACCESS DOORS AND PANELS

See Doors and Panels, Access

ACCUMULATORS, REFRIGERATION (FOR AIR CONDITIONING)

Bohn Aluminum & Brass Corp., Detroit, Mich.
Dole Refrigerating Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
King Zeero Co., The, Chicago, Ill.
McQuay, Inc., Minneapolis, Minn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Phillips & Co., H. A., Chicago, Ill.
Reco Products Div., Recony Corp., New York, N. Y.
Remco, Inc., Zelienople, Pa.
Techniflex Corp., Port Jervis, N. Y.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
Watkins Co., J. E., Maywood, Ill.
Wolverine Tube, Div. of Calumet & Helca, Inc., Detroit, Mich.
XL Refrigerating Co., Chicago, Ill.

ADHESIVES, FOR INSULATION OTHER THAN PIPE

Asbestos Asphalt Insulation Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Atlas Mineral Products Co., Mertztown, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Dow Corning Corp., Midland, Mich.
Durkee-Atwood Co., Minneapolis, Minn.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Eagle-Picher Co., Cincinnati, O.
Flintkote Co., The, New York, N. Y.
Formica Corp., The, Cincinnati, O.
Fuller Co. of Calif., H. B., San Francisco, Calif.
Gilbreth Co., The, Philadelphia, Pa. (Teflon)
Goodrich Industrial Products Co., B. F., Akron, O.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Miracle Adhesives Corp., Bellmore, N. Y.
Moore Inc., Goodloe E., Danville, Ill.
Presstite-Keystone Engineering Products Co., A Div. of American-Marietta Co., St. Louis, Mo.
Rubber & Asbestos Corp., Bloomfield, N. J.
St. Clair Rubber Co., Detroit, Mich.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.

ADHESIVES, FOR PIPE COVERING

Arabol Mfg. Co., New York, N. Y.
Armstrong Cork Co., Lancaster, Pa.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Durkee-Atwood Co., Minneapolis, Minn.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Flintkote Co., The, New York, N. Y.
Foster Co., Benjamin, Philadelphia, Pa.
Fuller Co. of Calif., H. B., San Francisco, Calif.
Grant Wilson, Inc., Chicago, Ill.
Industrial Laminates Div., Fabric Distributing Co., New York, N. Y.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Detroit, Mich.
Miracle Adhesives Corp., Bellmore, N. Y.
Moore Inc., Goodloe E., Danville, Ill.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
National Cork Co., Englewood, N. J.
National Pipe Coatings, Inc., Hungtington Park, Calif.
Pecora Paint Co., Inc., Philadelphia, Pa.
Presstite-Keystone Engineering Products Co., A Div. of American-Marietta Co., St. Louis, Mo.
Rubber & Asbestos Corp., Bloomfield, N. J.
Ruberoid Co., New York, N. Y.
St. Clair Rubber Co., Detroit, Mich.
Sauereisen Cements Co., Pittsburgh, Pa.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.
Swift & Co., Chicago, Ill.
Xylos Rubber Co., Akron, O.

ADSORBERS, ODOR

Abbeon Supply Co., Jamaica, N. Y.
Barnebey-Cheney Co., Columbus, O.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.
Chemurgic Process Corp., New York, N. Y.
Connor Engineering Corp., Danbury, Conn.
Elgin Softener Corp., Elgin, Ill.
Manning Co., Charles E., Pittsburgh, Pa.
Michael Electric Co., Inc., New Haven, Conn.
Oshkosh Filter & Softener Co., Oshkosh, Wis. (from water supply)
Pur Air Div., Barnebey-Cheney Co., Columbus, O.
Radex Corp., Chicago, Ill.
Research Products Corp., Madison, Wis.
S.O.S. Products Co., Inc., Brooklyn, N. Y.
Solvay Process Div., Allied Chemical & Dye Corp., New York, N. Y.
Tamms Industries, Inc., Chicago, Ill.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Williams Chemical Co., New York, N. Y.

ADSORPTION DEHUMIDIFIERS

See Dehumidifiers, Absorption and Adsorption

AFTERCOOLERS, COMPRESSED AIR

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Adams Co., Inc., R. P., Buffalo, N. Y.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Moistening Co., Providence, R. I.
Andale Co., Philadelphia, Pa.
Armstrong Co., Richard M., Westchester, Pa.
Binks Mfg. Co., Chicago, Ill.
Brown Fintube Co., The, Elyria, O.
Bury Compressor Co., Erie, Pa.
Buxton Mfg. Co., Dover, N. J.
Centrifix Corp., Cleveland, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Condenser Service & Engineering Co. Inc., Hoboken, N. J.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Davis Engineering Corp., Elizabeth, N. J.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Doyle and Roth Mfg. Co., Inc., Brooklyn, N. Y.
Graham Mfg. Co., Inc., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Ingersoll-Rand Co., New York, N. Y.
Johnson Corp., The, Three Rivers, Mich.
Joy Mfg. Co., Pittsburgh, Pa.
Manning & Lewis Engineering Co., Newark, N. J.
Modine Mfg. Co., Racine, Wis.

Niagara Blower Co., New York, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Schramm, Inc., West Chester, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spray Engineering Co., Somerville, Mass.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

AIR AFTERCOOLERS
See Aftercoolers, Compressed Air

AIR BREAK FITTINGS
See Fittings, Draining, Fixed Air Break

AIR CLEANERS
See Cleaners, Air, Electrical

AIR COMPRESSORS
See Compressors, Air

AIR CONDITIONERS
See Units, Air Conditioning

AIR CONDITIONING UNITS
See Units, Air Conditioning

AIR CURTAIN, DOORWAYS
See Doorways, Air Curtain, for Large Entrances

AIR DIFFUSERS
See Diffusers, Air; Grilles; Panels Perforated, for Air Diffusion; Registers

AIR ELIMINATORS
See Eliminators, Air

AIR FILTER CLEANING COMPOUNDS
See Compounds, Cleaning, Air Filter

AIR FILTER GAGES
See Gages, Air Filter

AIR FILTERS
See Filters, Air

AIR FRESHENING
See Compounds, Air Freshening; Adsorbers, Odor

AIR OPERATING VALVES
See Valves, Air Operating

AIR PURIFICATION
See Adsorbers, Odor; Compounds, Air Freshening

AIR RECOVERY EQUIPMENT
See Adsorbers, Odor

AIR SEPARATORS
See Separators, Air

AIR-TANKLESS WATER HEATERS
See Heaters, Water, Air-Tankless

AIR VALVES
See Valves, Radiators, Air

AIR VELOCITY METERS
See Meters, Air Velocity, Direct Reading; Anemometers

AIR VENTS
See Eliminators, Air

AIR VOLUME METERS
See Meters, Volume, Air and Gas

AIR WASHERS
See Washers, Air

ALARMS, COMBUSTIBLE GAS
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Hogart Engineering Co., Los Angeles, Calif.
Johnson-Williams Inc., Palo Alto, Calif.
Mine Safety Appliances Co., Pittsburgh, Pa.
Taller & Cooper, Inc., Brooklyn, N. Y.

ALARMS, HIGH AND LOW BOILER WATER
American District Telegraph Co., New York, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Copes-Vulcan Div., Blaw Knox Co., Erie, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
Diamond Power Specialty Corp., Lancaster, O.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Engelhard, Inc., Charles, East Newark, N. J.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fischer & Porter Co., Hatboro, Pa.
Johnson Corp., The, Three Rivers, Mich.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reliance Gauge Column Co., Cleveland, O.
Schaub Engineering Co., Fred H., Chicago, Ill.
Techniflex Corp., Port Jervis, N. Y.
Watts Regulator Co., Lawrence, Mass.
Way-Wolff Associates, New York, N. Y.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.

ALARMS, HIGH AND LOW FLOW, FOR PIPING SYSTEMS
Brooks Rotameter Co., Lansdale, Pa.
Fischer & Porter Co., Hatboro, Pa.
Henzey Co., Watertown, Wis.
Magnetrol, Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Techniflex Corp., Port Jervis, N. Y.

ALARMS, LIQUID LEVEL, AUDIBLE
American District Telegraph Co., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Boston Auto Gage Co., Pittsfield, Mass.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., Boody, Ill.
Ess Instrument Co., Bergenfield, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Magnetrol, Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
OPW Corp., Cincinnati, O.
Oil Equipment Mfg. Corp., New Haven, Conn.
Petrometer Corp., Long Island City, N. Y.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Reliance Gauge Column Co., Cleveland, O.
Ripley Co., Inc., Middletown, Conn.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scully Signal Co., Melrose, Mass.
Techniflex Corp., Port Jervis, N. Y.
Uehling Instrument Co., Paterson, N. J.
Way-Wolff Associates, New York, N. Y.

ALARMS, LIQUID LEVEL, VISUAL
Automatic Control Co., St. Paul, Minn.
Bristol Co., The, Waterbury, Conn.
Engelhard Inc., Charles, East Newark, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Instruments, Inc., Tulsa, Okla.
Magnetrol, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Reliance Gauge Column Co., Cleveland, O.
Uehling Instrument Co., Paterson, N. J.
Way-Wolff Associates, New York, N. Y.

ALARMS, SMOKE
American District Telegraph Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cardox Corp., Chicago, Ill.
Cleveland Fuel Equipment Co., Cleveland, Ohio
Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.
Defender Instrument & Regulator Co., Boody, Ill.
De-Tec-Tronic Corp., Chicago, Ill.
Edwards, L. V., Rockville Center, N. Y.
Ess Instrument Co., Bergenfield, N. J.
Heat-Timer Corp., New York, N. Y.
Instruments, Inc., Tulsa, Okla.
McNeill Smoke Eliminator Co., Chicago, Ill.
Reliance Instruments Mfg. Corp., Glen Cove, Long Island, N. Y.
Ripley Co., Inc., Middletown, Conn.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Sterns-Flinn Corp., New York, N. Y.
Way-Wolff Associates, New York, N. Y.
Worner Electronic Devices, Rankin, Ill.

ALARMS, TEMPERATURE
American District Telegraph Co., New York.
Bristol Co., The, Waterbury, Conn.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Custom Mfg. Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Devco Engineering Inc., Caldwell, N. J.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fischer & Porter Co., Hatsboro, Pa.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Thermo Electric Co., Inc., Saddle Brook, N.J.
United Electric Controls Co., Watertown, Mass.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

ALGAE AND SLIME CONTROL, WATER TREATMENT FOR
See Treatment, Water, for Slime and Algae Control

ALUMINUM COATED SHEETS
See Sheets, Aluminum Coated

ALUMINUM PIPE
See Pipe, Aluminum

ALUMINUM SHEETS
See Sheets, Aluminum

ANALYZERS, CARBON DIOXIDE, PORTABLE
Airserco Mfg. Co., Inc., Pittsburgh, Pa. (electrical)
Bacharach Industrial Instrument Co., Pittsburgh, Pa. (also for carbon monoxide)
Barclay, Inc., Robert, Chicago, Ill.
Cardox Corp., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Engelhard, Inc., Chas., East Newark, N. J.
Hays Corp., Michigan City, Ind.
Permutit Co., New York, N. Y.

Preferred Utilities Mfg. Corp., New York, N. Y.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.
Will Corp., Rochester, N. Y.

ANCHORS FOR INSULATION

See Fasteners, Insulation

ANEMOMETERS

Abbeon Supply Co., Jamaica, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Beckman & Whitley, Inc., San Carlos, Calif.
Dietzgen Co., Eugene, Chicago, Ill.
Flow Corp., Cambridge, Mass. (Hot wire)
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
General Scientific Equipment Co., Philadelphia, Pa.
Hastings-Raydist, Inc., Hampton, Va.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Mine Safety Appliances Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Willson Products Co., Reading, Pa.

ANGLE VALVES

See Valves, Angle

ANGLES, BARS, BEAMS, CHANNELS AND TEES (LIGHT WEIGHT SHAPES)

Allegheny Ludlum Steel Corp., Pittsburgh, Pa. (Stainless)
Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
Atlantic Steel Co., Atlanta, Ga.
Bethlehem Steel Co., Bethlehem, Pa.
Bridgeport Brass Co., Bridgeport, Conn. (aluminum)
Byers Co., A. M., Pittsburgh, Pa.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Dow Chemical Co., The, Midland, Mich.
Goodrich Industrial Products Co., B. F., Akron, O. (rigid)
Harvey Aluminum, Torrance, Calif.
Inland Steel Co., Chicago, Ill.
Inland Steel Products Co., Milwaukee, Wis.
International Steel Co., Evansville, Ind.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Kling Bros. Engineering Wks., Chicago, Ill.
Laclede Steel Co., St. Louis, Mo.
Lees Div., John, The Serrick Corp., Muncie, Ind.
Mesker Steel Corp., Geo. L., Evansville, Ind.
Redi-Bolt, Inc., East Chicago, Ind.
Republic Steel Corp., Cleveland, O.
Revere Copper and Brass, Inc., New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
Truscon Steel Div., Republic Steel Corp., Youngstown, O.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

ANODES FOR CORROSION PROTECTION

See Devices, Electrolytic, for Preventing Corrosion

ANTI-FREEZE COMPOUNDS FOR SNOW MELTING

See Compounds, Anti-Freeze

AQUASTATS

See Thermostats

ARC WELDERS

See Welders, Arc

ARC WELDING ELECTRODES

See Electrodes, Arc Welding

ASBESTOS FIBER AND CEMENT PIPE

See Pipe, Asbestos Fiber and Cement

ASBESTOS MATERIALS

See Insulation

ASBESTOS PACKING

See Packing, Asbestos

ASH CONVEYORS

See Conveyors, Coal and Ash

ASSEMBLIES, MANIFOLD, FOR METERS

Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.

ATOMIZING NOZZLES

See Nozzles, Atomizing

AXIAL FLOW FANS

See Fans, Axial Flow, Pressure Type

BACKING RINGS

See Rings, Welding

BALANCE CLIPS

See Clips, Balance, Blower Wheel

BALANCING ELBOWS AND TEES, FOR HOT WATER HEATING AND CHILLED WATER SYSTEMS

See Elbows and Tees, Balancing, for Hot Water Heating and Chilled Water Systems

BALANCING EQUIPMENT

See Equipment, Balancing

BALANCING VALVES

See Valves, Balancing

BALL BEARINGS

See Bearings, Ball

BAROMETRIC CONTROLS

See Controls, Draft, Barometric

BARRIERS, VAPOR, FOR BUILDING INSULATION

Alumiseal Corp., New York, N. Y.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Infra Insulation, Inc., New York, N. Y.
Revere Copper & Brass, Inc., Standard Rolling Mills Div., Brooklyn, N. Y.

BARRIERS, VAPOR, FOR DUCT INSULATION

Alumiseal Corp., New York, N. Y.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Infra Insulation, Inc., New York, N. Y.

BARRIERS, VAPOR, FOR PIPE INSULATION

Alumiseal Corp., New York, N. Y.
Armstrong Cork Co., Lancaster, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Infra Insulation, Inc., New York, N. Y.
Owens-Corning Fiberglas Corp., Toledo, O.
Revere Copper & Brass, Inc., Standard Rolling Mills Div., Brooklyn, N. Y.

BASEBOARD RADIATION

See Radiation, Baseboard

BASES, MOTOR, TENSION ADJUSTING

Ackermann Mfg. Co., Wheeling, W. Va.
Alexander Bros., Philadelphia, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Clarage Fan Co., Kalamazoo, Mich.
Electrovent Fan & Mfg. Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Reeves Pully Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind.
Rhoads & Sons, J. E., Wilmington, Del.
Valley Foundry & Machine Works, Inc., Fresno, Calif.

BASES AND PADS, VIBRATION ISOLATING

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Felt Co., Glenville, Conn.
Barry Controls, Inc., Watertown, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Celotex Corp., The, Chicago, Ill.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Felters Company, The, Boston, Mass.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexlock Corp., Kent, O.
General Tire & Rubber Co., Industrial Products Div., Wabash, Ind.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hobsite Products Co., Harrison, N. J.
Johns-Manville, New York, N. Y.
Korfund Co., Inc., Long Island City, N. Y.
L.O.F. Glass Fibers Co., Toledo, O.
Lord Mfg. Co., Erie, Pa.
M B Mfg. Co., The, New Haven, Conn.
National Cork Co., Englewood, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Raybestos-Manhattan, Inc., Passaic, N. J.
Robinson Aviation, Inc., Teterboro, N. J.
Sponge Products Div., B. F. Goodrich Co., Shelton, Conn.
Spring Packing Corp., Chicago, Ill.
United Cork Companies, Kearny, N. J.
United States Rubber Co., New York, N. Y.
Vibration Eliminator Co., Long Island City, N. Y.
Vibration Mountings, Inc., Corona, N. Y.
Western Felt Works, Chicago, Ill.
Wood Conversion Co., St. Paul, Minn.

BEARINGS, BALL

Aetna Ball & Roller Bearing Co., Chicago, Ill.
Ahlberg Bearing Co., Chicago, Ill.
Bearings Co. of America, Div. of Federal-Mogul-Bower Bearings, Inc., Lancaster, Pa.
Boston Gear Works, Quincy, Mass.
Dodge Mfg. Corp., Mishawaka, Ind.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y. (for dampers)
Fafnir Bearing Co., The, New Britain, Conn.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Nice Ball Bearing Co., Philadelphia, Pa.
Norma-Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Philadelphia, Pa.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, NEEDLE

Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Roller Bearing Co. of America, West Trenton, N. J.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.

BEARINGS, PILLOW BLOCK

Ahlberg Bearing Co., Chicago, Ill.
Anti-Friction Bearings Co., Los Angeles, Calif.
Bearings Co. of America, Div. of Federal-Mogul-Bower Bearings, Inc., Lancaster, Pa.
Boston Gear Works, Quincy, Mass.
Chain Belt Co., Milwaukee, Wis.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., The, New Britain, Conn.

Goldens' Foundry & Machine Co., Columbus, Ga.
Hewitt-Robins Inc., Stamford, Conn.
Jeffrey Mfg. Co., Columbus, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Lau Blower Co., Dayton, O.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
Moraine Products Div., General Motors Corp., Dayton, O.
Randall Graphite Bearings, Inc., Lima, O.
Royersford Foundry & Machine Co., Inc., Royersford, Pa.
SKF Industries, Inc., Philadelphia, Pa.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Shafer Bearing, Div. of Chain Belt Co., Downers Grove, Ill.
Standard Pressed Steel Co., Jenkintown, Pa.
Triangle Mfg. Co., Oshkosh, Wis.
Whiteley Bearing Corp., Chicago, Ill.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, ROLLER

Aetna Ball & Roller Bearing Co., Chicago, Ill.
Berna Co., A. J., Roseville, Mich.
Chain Belt Co., Milwaukee, Wis.
Dodge Mfg. Corp., Mishawaka, Ind.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Roller Bearing Co. of America, West Trenton, N. J.
Royersford Foundry & Machine Co, Inc., Royersford, Pa.
SKF Industries, Inc., Philadelphia, Pa.
Shafer Bearing, Div. of Chain Belt Co., Downers Grove, Ill. (self aligning)
Timken Roller Bearing Co., Canton, O.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.

BEARINGS, SLEEVE

Aetna Ball & Roller Bearing Co., Chicago, Ill.
Ampco Metal, Inc., Milwaukee, Wis.
Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Bronze Bearings, Inc., Cranford, N. J.
Cleveland Graphite Bronze Co., Cleveland, O.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dodge Mfg. Corp., Mishawaka, Ind.
Federal-Mogul Div., Federal-Mogul-Bower Bearings, Inc., Detroit, Mich.
Gatke Corp., Chicago, Ill.
Green Fuel Economizer Co., Beacon, N. Y.
Haveg Industries, Inc., Newark, Del. (plastic)
International Powder Metallurgy, Inc., Ridgway, Pa.
Johnson Bronze Co., New Castle, Pa.
Keystone Carbon Co., Inc., St. Marys, Pa.
Lau Blower Co., Dayton, O.
Link Belt Co., Chicago, Ill.
Moraine Products Div., General Motors Corp., Dayton, O.
Morganite, Inc., Carbon Specialties Div., Long Island City, N. Y.
Morrison Products, Inc., Cleveland, O.
Randall Graphite Bearings, Inc., Lima, O.
Whiteley Bearing Corp., Chicago, Ill.

BELLOWS, THERMOSTATIC AND METALLIC

Arrowhead Rubber Co., Long Beach, Calif.
Bishop & Babcock Mfg. Co., Cleveland, O.
Breeze Corporations, Inc., Union, N. J.
Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., Milford, Conn.
Bristol Co., The, Waterbury, Conn.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Flexonics Corp., Maywood, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Solar Aircraft Co., San Diego, Calif.
Titeflex, Inc., East Springfield, Mass.
Zallea Bros., Wilmington, Del.

BELTING, FLAT, LEATHER

Alexander Bros., Philadelphia, Pa.
Allen Mfg. Co., W. D. Chicago, Ill.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Graton & Knight Co., Inc., Worcester, Mass.
Houghton & Co., E. F., Philadelphia, Pa.
Rhoads & Sons, J. E., Wilmington, Del.
Schieren Co., Chas. A., New York, N. Y.
Sikes Co., S. R., Minneapolis, Minn.
Williams & Son, I. B., Dover, N. H.

BELTING, FLAT, RUBBER

Armstrong Cork Co., Lancaster, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins, Inc., Stamford, Conn.
New York Belting & Packing Co., Passiac, N. J.
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Thermoid Co., Trenton, N. J.
United States Rubber Co., New York, N. Y.

BELTS, TOOTH-GRIP OR COG

Dayton Rubber Co., Dayton, O.
Lovejoy Flexible Coupling Co., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.

BELTS, V

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
America Pulley Co., Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Maysville, Ky.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dayton Rubber Co., Dayton, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Gates Rubber Co., Denver, Colo.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Manheim Mfg. & Belting Co., Manheim, Pa.
Maurey Mfg. Corp., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Pyott Foundry & Machine Co., Chicago, Ill.
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Rhoads & Sons, J. E., Wilmington, Del.
Schieren Co., Chas. A., New York, N. Y.
Sikes Co., S. R., Minneapolis, Minn. (leather)
Thermoid Co., Trenton, N. J.
United States Rubber Co., New York, N. Y.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J.
Zatko Metal Products Co., Euclid, O.

BENDERS, PIPE

American Pipe Bending Machine Co., Inc., Poultney, Vt.
American Pipe Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Buffalo Forge Co., Buffalo, N. Y.
Caranth Co., St. Louis, Mo.
Crown Die & Tool Corp., Chicago, Ill. (Hand)
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Hill, Inc., Walter P., Detroit, Mich.
Holsclaw Bros., Inc., Evansville, Ind.
Hossfeld Mfg. Co., Winona, Minn.
Imperial Brass Mfg. Co., Chicago, Ill.
Lidseen, Inc., Gustave, Hayesville, N. C.
Milton Equipment Co., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Pedrick Tool & Machine Co., Philadelphia, Pa.
Pines Engineering Co., Inc., Aurora, Ill.
Radiant Devices, St. Louis, Mo.
Sac Tool Mfg. Co., St. Louis, Mo.
Skinner Co., M. B., South Bend, Ind.
Tal Bending Equipment, Inc., Milwaukee, Wis.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vanderman Mfg. Co., Willimantic, Conn.
Wallace Supplies Mfg. Co., Chicago, Ill.
Wilson Co., K. R., Arcade, N. Y.

BENDERS, TUBING

Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Wks., Allentown, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Duro Metal Products Co., Chicago, Ill.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Griffith Equipment Co., Inc., Los Angeles, Calif.
Hill, Inc., Walter P., Detroit, Mich.
Holsclaw Bros., Inc., Evansville, Ind.
Hossfeld Mfg. Co., Winona, Minn.
Imperial Brass Mfg. Co., Chicago, Ill.
Leonard Precision Products Co., Santa Ana, Calif.
Milton Equipment Co., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Parker Appliance Co., The, Cleveland, O.
Pedrick Tool & Machine Co., Philadelphia, Pa.
Pines Engineering Co., Inc., Aurora, Ill.
Republic Steel Corp., Steel and Tubes Div., Cleveland, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Steel City Electric Co., Pittsburgh, Pa.
Tal Bending Equipment, Inc., Milwaukee, Wis.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Wallace Supplies Mfg. Co., Chicago, Ill.
Wilson Co., K. R., Arcade, N. Y.
Wilson Manufacturing Co., Memphis, Tenn.

BENDS, EXPANSION, STEAM PIPE

Albert Pipe Supply Co., Brooklyn, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Atlantic Pipe Bending & Fabricating Corp., Wood-Ridge, N. J.
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Durant Insulated Pipe Co., Palo Alto, Calif.
Flori Pipe Co., The, St Louis, Mo.
Gerry Tool Co., The, Bristol, Conn.
Grinnell Co., Inc., Providence, R. I.
Kaiser Co., E. B., Glenview, Ill.
Kellogg Co., M. W., The, New York, N. Y.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Parks-Cramer Co., Fitchburg, Mass.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Rempe Co., Chicago, Ill.
Ric-wiL, Inc., Barberton, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Shaw Co., Benjamin F., Wilmington, Del.
Shaw-Kendall Engineering Co., Toledo, O.
Taylor Engineering Corp., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.

Western Piping & Engineering Co., San Francisco, Calif.
Whitlock Mfg. Co., W. Hartford, Conn.

BI-METALS, THERMOSTATIC

Baker & Co., Inc., Newark, N. J.
Chace Co., W. M., Detroit, Mich.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Wilson Co., H. A., The, Union, N. J.

BLADES, PROPELLER FAN

Ackermann Mfg. Co., Wheeling, W. Va.
Aerovent Fan Co., Inc., Piqua, O.
Aire-Foile Fan & Blower Co., Detroit, Mich.
Airmaster Corp., Chicago, Ill.
Alloy Propeller, Zelionople, Pa.
Bertram Co., Harvey P., The, Cincinnati, O.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brookside Corp., McCordsville, Ind.
Burden Co., Alan E., Los Angeles, Calif.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Dayton Rubber Co., Dayton, O.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Frigid, Inc., Brooklyn, N. Y.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
International Engrg. Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Martin Fan & Blower Co., Chicago, Ill.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Myers Electric Co., Inc., Pittsburgh, Pa.
Peerless Electric Co., Warren, O.
Robinson Ventilating Co., Zelienople, Pa.
Schwitzer Corp., Indianapolis, Ind.
South Bend Air Products, Inc., South Bend, Ind.
Standard Electric Mfg. Co., West Berlin, N. J.
Torrington Mfg. Co., Torrington, Conn.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Wind-Way Fan & Ventilator Co., New Orleans, La.

BLAST GATES

See Gates, Blast

BLAST HEATERS

See Surface, Finned, Heating

BLAST HEATING COILS

See Surface, Finned, Heating

BLINDS, LINE, PIPE

Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Hamer Valves, Inc., Long Beach, Calif.
Smith-Blair, Inc., South San Francisco, Calif.
Vernon Tool Co., Ltd., Alhambra, Calit.

BLOCKS, TERMINAL, FOR ELECTRICAL CONNECTIONS

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Kulka Electric Mfg. Co., Inc., Mt. Vernon, N. Y.
Marathon Electric Mfg. Corp., Wausau, Wis.
Sealed Unit Parts Co., Inc., Bronx, N. Y.

BLOW PIPE FITTINGS

See Fittings, Blow Pipe

BLOWER FANS

See Fans, Axial Flow and Fans, Centrifugal

BLOWER HOUSINGS

See Housings, Fan

BLOWER WHEELS

See Wheels, Blower

BLOWERS, HIGH PRESSURE

For Low Pressure Blower Fans, See Fans, Centrifugal

Air Fan Engineering Co., Los Angeles, Calif.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Blower Corp., Detroit, Mich.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co., Milwaukee, Wis.
Beach-Russ Co., New York, N. Y.
Brookside Corp., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Carling Turbine Blower Co., Worcester, Mass.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
De Laval Steam Turbine Co., Trenton, N. J.
Dynamic Air Engineering, Inc., Los Angeles, Calif.
Eclipse Fuel Engineering Co., Rockford, Ill.
Elliott Co., Jeannette, Pa.
Frigid, Inc., Brooklyn, N. Y.
General Blower Co., Morton Grove, Ill.
Hauck Mfg. Co., Brooklyn, N. Y.
Ilg Electric Ventilating Co., Chicago, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (plastic construction for exhaust and corrosive fumes)
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Kice Metal Products Co., Wichita, Kans.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
North American Mfg. Co., Cleveland, O.
Peerless Electric Co., Warren, O.
Power Engineering Co., Chicago, Ill.
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Read Standard Corp., Blower-Stoker Div., York, Pa.
Research Vacuum Supply Co., Chicago, Ill.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Roots-Connersville Blower Corp., Connersville, Ind.
Spencer Turbine Co., Hartford, Conn.
Standard Electric Mfg. Co., West Berlin, N. J.
Sutorbilt Corp., Los Angeles, Calif.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Philadelphia, Pa.
Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

BLOWERS, SOOT

Air Fan Engineering Co., Los Angeles, Calif.
Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Bayer Co., St. Louis, Mo.
Chesterton Co., A. W., Everett, Mass.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Diamond Power Specialty Corp., Lancaster, O.
Marion Machine Foundry & Supply Co., Marion, Ind.

BLOW-OFF VALVES

See Valves, Blow-of

BLUE PRINT MACHINES

See Machines, Blue Print and White Print

BOARDS, PANEL AND CONTROL

Ace Engineering Co., Chicago, Ill.
Adam Electric Co., Frank, St. Louis, Mo.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Auto-Control Laboratories, Culver City, Calif.
Automatic Switch Co., Orange, N. J.
Barber-Colman Co., Rockford, Ill.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Burke Engineering, Los Angeles, Calif.
Continental Electric Equipment Co., Cincinnati, O.
Devco Engineering, Inc., Caldwell, N. J.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Falstrom Co., Passaic, N. J.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Corp., Michigan City, Ind.
International Business Machines Corp., New York, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Johns-Manville, New York, N. Y. (asbestos ebony)
Littleford Bros., Inc., Cincinnati, O.
Marsh Instrument Co., Skokie, Ill.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
Reliance Electric & Engineering Co., Cleveland, O.
Square D Co., Detroit, Mich.
Taller & Cooper, Inc., Brooklyn, N. Y.
Trerice Co., H. O., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Whiddett Co., John C., Drexel Hill, Pa.
Will-Burt Co., Orrville, O.
York-Shipley, Inc., York, Pa.

BOILER CLEANING COMPOUNDS

See Compounds, Boiler Cleaning

BOILER FEED PUMPS

See Pumps, Boiler Feed

BOILER FEEDERS

See Feeders, Water, Heating Boiler

BOILER GAGES

See Gages, Liquid Level

BOILER OBSERVATION PORTS

See Ports, Observation, Boiler

BOILER SEALING COMPOUNDS

See Compounds, Boiler and Radiator Sealing

BOILER AND TANK INSULATION

See Insulation, Boiler and Tank

BOILER TUBES

See Tubes, Boiler

BOILER WATER ALARMS

See Alarms, High and Low Boiler Water

BOILERS, ELECTRIC

See Generators, Steam; Electric

BOILERS, HEATING, CAST IRON, SECTIONAL

2000 *Sq Ft Steam Radiation and Over*

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bryant, Div. of Carrier Corp., Indianapolis.
Burnham Corp., Irvington, N. Y.
Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Gilbert & Barker Mfg. Co., West Spring, Mass.
Mueller Climatrol, Milwaukee, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Peerless Heater Co., The, Div. of the Eastern Foundry Co., Boyertown, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Prox Co., Inc., Frank, Terre Haute, Ind.
Richmond Plumbing Fixtures Div., Rheem Mfg. Co., Metuchen, N. J.
Smith Co., Inc., H. B., The, Westfield, Mass.
Surface Combustion Corp., Toledo, O.
Weil-McLain Co., Michigan City, Ind.

BOILERS, HEATING, STEEL, FIRE TUBE

2000 *Sq Ft Steam Radiation and Over*

Aldrich Co., Wyoming, Ill.
Ames Iron Works, Inc., Oswego, N. Y.
Atlantic Steel Boiler Co., Philadelphia, Pa.
Bigelow Co., New Haven, Conn.
Birchfield Boiler, Inc., Tacoma, Wash.
Boiler Engineering & Supply Co., Phoenixville, Pa.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Burkhart Engineering Associates, Inc., Boston, Mass.
Burnham Corp., Irvington, N. Y.

Columbia Boiler Company of Pottstown, Pottstown, Pa.
Combustion Engineering, Inc., New York.
Crotty Mfg. Corp., Flushing, L. I., N. Y.
Dillon Steam Boiler Wks., Inc., D. M., Fitchburg, Mass.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Erie City Iron Wks., Erie, Pa.
Farrar & Trefts Div., ADSCO Industries, Inc., Buffalo, N. Y.
Federal Boiler Co., Inc., Midland Park, N. J.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
Gabriel Boiler & Fabrication Co., Portland, Ore.
Hamburg Boiler Works, Inc., Hamburg, Pa.
Hodge Boiler Wks., East Boston, Mass.
Johnston Bros., Inc., Ferrysburg, Mich.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp., Kewanee, Ill.
Leffel & Co., James, Springfield, O.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Mund Boilers, Inc., Los Angeles, Calif.
Murray Iron Wks. Co., Burlington, Ia.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Norse Boiler Co., Inc., New Market, N. J.
Orr & Sembower, Inc., Reading, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa. (400 sq ft thru 60710 sq ft)
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Smith Twin Tubular Boiler Co., Inc., Philadelphia, Pa.
Spencer Heater, Lycoming Division, Avco Mfg. Corp., Williamsport, Pa.
Stout & Sons, David, St. Louis, Mo.
Terre Haute Boiler Works Co., Terre Hauta, Ind.
Titusville Iron Wks. Co., The, Titusville, Pa.
Viking Mfg. Corp., Cleveland, O.
Way-Wolff Associates, New York, N. Y.
Wickes Boiler Co., Saginaw, Mich.
York-Shipley, Inc., York, Pa.

BOILERS, HEATING, STEEL, TUBELESS

Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Eckhart Mfg. Co., Inc., Union, N. J.
Embassy Steel Products, Inc., Brooklyn, N.Y.
General Heating Products Co., Philadelphia, Pa.
Manville Boiler Co., Inc., Hackettstown, N.J.
Republic Products Co., Philadelphia, Pa.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Viking Mfg. Corp., Cleveland, O.
York-Shipley, Inc., York, Pa.

BOILERS, HEATING, STEEL, WATER TUBE

Ajax Boiler & Heater Co., Gardena, Calif.
Anetsberger Bros., Inc., Northbrook, Ill.
Auburn Burner Co., Auburn, Ind.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bigelow Co., The, New Haven, Conn.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Bryan Steam Corp., Peru, Ind.
Central States Steel Boiler Co., Chicago, Ill.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Combustion Engineering, Inc., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Corp., Flushing, L. I., N. Y.
Erie City Iron Wks., Erie, Pa.
International Boiler Wks. Co., The, East Stroudsburg, Pa.
Keeler Co., E., Williamsport, Pa.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Mund Boilers, Inc., Los Angeles, Calif.
Murray Iron Wks. Co., Burlington, Ia.
Nebraska Boiler Company, Inc., Lincoln, Nebr.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Raypak Co., Inc., Los Angeles, Calif.
Riley Stoker Corp., Worcester, Mass.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
San Gabriel Boiler Mfg. Co., San Gabriel, Calif.
Springfield Boiler Co., Springfield, Ill.
Titusville Iron Works Co., The, Titusville, Pa.
V. & E. Products, Inc., Schuylkill Haven, Pa.
Vogt Machine Co., Henry, Louisville, Ky.
Wickes Boiler Co., Saginaw, Mich.
York-Shipley, Inc., York, Pa.
Zingheim Co., William C., Chicago, Ill.

BOILERS, PACKAGED UNITS, HEATING AND PROCESS—*including Controls, Feed Pump, etc.*

Ames Iron Works, Inc., Oswego, N. Y.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bigelow Co., The, New Haven, Conn.
Boiler Engineering & Supply Co., Phoenixville, Pa.
Bros Boiler & Mfg. Co., Wm., Minneapolis.
Brown Fintube Co., The, Elyria, O.
Burkhart Engineering Associates, Inc., Boston, Mass.
Clayton Mfg. Co., El Monte, Calif.
Cleaver-Brooks Co., Milwaukee, Wis. (oil-gas: 15-60 hp; CB: 15-200 hp; LR: 250-600 hp; oil, gas and combination oil-gas)
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Combustion Engineering, Inc., New York, N. Y. (4,000 lb/Hr to 40,000 lb/Hr)
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cyclotherm Div., National-U. S. Radiator Corp., Oswego, N. Y.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
Erie City Iron Works, Erie, Pa.
Farrar & Trefts Div., ADSCO Industries, Inc., Buffalo, N. Y.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
Foster Wheeler Corp., New York, N. Y.
Gabriel Boiler Co., Portland, Ore. (3-500 HP)
General Heating Products Co., Philadelphia, Pa.
Hoffberger Co., C., Baltimore, Md. (12 to 600 hp, oil fuel, 15 to 150 psi)
Hydrotherm, Inc., Northvale, N. J. (Gas Fired only. 45,000 to 500,000 Btu input; 100 psi ASME)
International Boiler Works Co., East Stroudsburgh, Pa.
Iron Fireman Mfg. Co., Cleveland, O.
Johnston Bros., Inc., Ferrysburg, Mich.
Keeler Co., E., Williamsport, Pa.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp., Kewanee, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Kresky Mfg. Co., Inc., Petaluma, Calif. (gas, 104,000 & 208,000 Btu per hr input)
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Leffel & Co., James, Springfield, O.
Littleford Bros., Inc., Cincinnati, O.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn. (3 hp thru 80 hp — oil or gas)
Martin Co., Inc., J. O., San Francisco, Calif.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Mund Boilers, Inc., Los Angeles, Calif.
Murry Iron Works Co., Burlington, Ia.
Nebraska Boiler Co., Inc., Lincoln, Nebr.
Orr & Sembower, Inc., Reading, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa. (400 sq ft thru 50,000 sq ft oil or gas 15 psig steam, 30 psig water)
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif. (1½ Hp - 125 Hp. Pressure to 200 psi. Gas, oil and combination firing)
Patco Mfg. Co., Philadelphia, Pa. (580 to 720 sq ft)
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (oil: 440-1440 edr; 0-30 psi oil; and gas)
Petro, Cleveland, O. (up to 450 hp gas, oil and combination; high pressure)
Preferred Utilities Mfg. Corp., New York. (20 to 600 boiler hp. Design pressure from 15 to 250 psi. All grades of oil and gas or combination gas and oil)
Ray Oil Burner Co., San Francisco, Calif.
Republic Products Co., Philadelphia, Pa.
Rite Engineering & Mfg. Corp., Los Angeles.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O. (114,000 to 1,000,000 Btu gas or oil)
Sellers Engineering Co., Chicago, Ill.
Springfield Boiler Co., Springfield, Ill. (6,000 to 54,000 lb per hr, 200 to 900 psig, gas & oil fired)
Stout & Sons, David, St. Louis, Mo. (up to 1430 sq ft EDR; up to 200 psig; gas and oil fuels)
Superior Combustion Industries, Inc., New York, N. Y.
Texsteam Corp., Houston, Tex.
Titusville Iron Works Co., The, Titusville, Pa.
Union Iron Works, Erie, Pa.
Vapor Heating Corp., Chicago, Ill.
Vogt Machine Co., Henry, Louisville, Ky. (10,000 to 40,000 lb of steam per hr capacities)
Way-Wolff Associates, New York, N. Y.
Wickes Boiler Co., Saginaw, Mich.
York-Shipley, Inc., York, Pa.

BOILERS, PORTABLE, STEAM FOR STEAM CLEANING, MISCELLANEOUS PROCESS, OTHER USES

Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Lattner Mfg. Co., P. M., Cedar Rapids, Ia.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn.
Murray Iron Wks. Co., Burlington, Ia.
Nebraska Boiler Co., Inc., Lincoln, Nebr.
Texsteam Corp., Houston, Tex.
Vapor Heating Corp., Chicago, Ill.

BOLTS, EXPANSION

Arro Expansion Bolt Co., Marion, O.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago, Ill.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Harper Co., H. M., Morton Grove, Ill.
Holub Industries, Inc., Sycamore, Ill.
Industrial Screw Co., Chicago, Ill.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
National Lead Co., New York, N. Y.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Polis Mfg. Co., J. D., Chicago, Ill.
Rawlplug Co., Inc., The, New Rochelle, N. Y.
Star Expansion N. Y., Inc., New York, N. Y.
U. S. Expansion Bolt Co., York, Pa.

BOLTS AND STUDS, FLANGE

Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Clark Bros. Bolt Co., Milldale, Conn.
Continental Screw Co., New Bedford, Mass.
Erie Bolt & Nut Co., Erie, Pa.
Harper Co., H. M., Morton Grove, Ill.
Haskell Mfg. Co., Wm. H., Pawtucket, R. I.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
Phoell Mfg. Co.,- Chicago, Ill.
Polis Mfg. Co., J. D., Chicago, Ill.
Redi-Bolt, Inc., East Chicago, Ind.
Republic Steel Corp., Bolt & Nut Div., Cleveland, O.
Rockford Screw Products Co., Rockford, Ill.
Russell, Purdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Victor Products Corp., Chicago, Ill.
Wolfe Co., Inc., The, Franklin C., Culver City, Calif.

BOLTS, TOGGLE AND ANCHOR

Arro Expansion Bolt Co., Marion, O.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago, Ill.
Crawford Co., Chicago, Ill.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.

Holub Industries, Inc., Sycamore, Ill.
Huck Mfg. Co., Detroit, Mich.
Industrial Screw Co., Chicago, Ill.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Moore, Inc., Goodloe E., Danville, Ill.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Polis Mfg. Co., J. D., Chicago, Ill.
Rawlplug Co., Inc., The, New Rochelle, N. Y.
Republic Steel Corp., Bolt & Nut Div., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Star Expansion N. Y., Inc., New York, N. Y.
U. S. Expansion Bolt Co., York, Pa.
Western Wire Products Co., St. Louis, Mo. (flattened lag)

BOLTS, "U"

Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Betnlehem Steel Co., Bethlehem, Pa.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Lamson & Sessions Co., The, Cleveland, O.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Republic Steel Corp., Bolt & Nut Div., Cleveland, O.
Steel City Electric Co., Pittsburgh, Pa.

BOOKS, TECHNICAL DATA

Color-Art Printing & Stationery Co., Kirkwood, Mo.
Lefax Publishers, Philadelphia, Pa.

BOOSTERS, GAS

Beach-Russ Co., New York, N. Y.
Bury Compressor Co., Erie, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eisler Engineering Co., Inc., Newark, N. J.
Leiman Bros., Inc., Newark, N. J.
North American Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Roots-Connersville Blower Div., Connersville, Ind.

BOOTHS, PAINTING, SPRAY

Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., The, Livingston, N. J.
Burdett Mfg. Co., Chicago, Ill.
Carolina Blower Co., Inc., Greensboro, N. C.
Centri-Spray Corp., Livonia, Mich. (wet type)
DeVilbiss Co., The, Toledo, O.
Goethel Sheet Metal Works, Inc., Alfred; Milwaukee, Wis.
Griffin & Co., Louisville, Ky.
Kirk & Blum Mfg. Co., Cincinnati, O.
Lumm Co., A. H., Toledo, O.
M & E Mfg. Co., Indianapolis, Ind.
Mahon Co., R. C., The, Detroit, Mich.
Newcomb-Detroit Co., Detroit, Mich.
Peters-Dalton, Inc., Detroit, Mich.
Plummer Spray Equipment Co., Napolean, O.
Schmieg Industries, Inc., Detroit, Mich.
Spray Engineering Co., Somerville, Mass.
Young & Bertke Co., Cincinnati, O.

BRAKES, SHEET METAL, HAND

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Dreis & Krump Mfg. Co., Chicago, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Works, Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
St. Louis Tool Co., St. Louis, Mo.
Whitney Metal Tool Co., Rockford, Ill.

BRAKES, SHEET METAL, PORTABLE

Barth Engineering & Mfg. Co., Inc., Milldale, Conn
Dreis & Krump Mfg. Co., Chicago, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Whitney Metal Tool Co., Rockford, Ill.

BRAKES, SHEET METAL, POWER

Bath Co., Cyril, The Solon, O.
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Crane & Eng. Co., Wickliffe, O.
Diamond Machine Tool Co., Pico, Calif.
Dreis & Krump Mfg. Co., Chicago, Ill.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Verson Allsteel Press Co., Chicago, Ill.
Verson Mfg. Co., The, Dallas, Tex.
Whitney Metal Tool Co., Rockford, Ill.
Wilson Co., K. R., Arcade, N. Y. (Hydraulic)

BRASS PIPE

See Pipe, Brass and Copper

BRASS TUBING

See Tubing, Brass and Copper

BRASS UNIONS

See Unions, Brass

BRASS VALVES

See Valves, Gate; and Valves, Globe

BRAZING TORCHES

See Torches, Brazing

BREAKERS, VACUUM (For Steam Using Equipment)

Associated Valve & Engineering Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
McAlear Mfg. Co., Chicago, Ill.
Perfecting Service Co., Charlotte, N. C.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.

BRONZE VALVES

See Valves, Gate; and Valves, Globe

BUILDING INSULATION

See Insulation, Building

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL

Adams Mfg. Co., Cleveland, O.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Aston Products, Inc., Hazel Park, Mich.
Auburn Foundry Inc., Heating Div., Auburn, Ind.
Automatic Corp., St. Louis, Mo.
Barber Mfg. Co., Cleveland, O.
Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Bryant Industrial Products Corp., Cleveland, O.
Burdett Mfg. Co., Chicago, Ill.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Coppus Engineering Corp., Worcester, Mass.
Dalzen Mfg. Co., St. Clair, Mich.
Downing Steel Products, Dayton, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eisler Engineering Co., Inc., Newark, N. J.
Engineer Co., New York, N. Y.
Faber Engineering Co., Inc., Philadelphia, Pa.
Forney Engineering Co., Dallas, Tex.
Fuelguard Co., Dallas, Tex.
Gordon & Piatt, Inc., Winfield, Kan.
H-P Products, Inc., Louisville, O.
Haney Gas Burner & Engineers, Inc., Monrovia, Calif.
Hastings Air Control, Inc., Omaha, Nebr.
Hauck Mfg. Co., Brooklyn, N. Y.
Incinerator Products, Inc., Detroit, Mich.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Jamieson Mfg. Co., Dallas, Tex.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Laharco Industries, Minneapolis, Minn.
Lattner Mfg. Co., P. M., Cedar Rapids, Ia.
Leahy Mfg. Co., Los Angeles, Calif.
Lennox Industries, Inc., The, Marshalltown, Ia.
Lientz Co., B. P., Kansas City, Mo.
Martin Co., Inc., J. O., San Francisco, Calif.
Maxon Premix Burner Co., Muncie, Ind.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Mid-Continent Metal Products Co., Chicago, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O.
North American Mfg. Co., Cleveland, O.
Orr & Sembower, Inc., Reading, Pa.
Peabody Engrg. Corp., New York, N. Y.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Petro, Cleveland, O.
Quiet-Heet Mfg. Corp., Subsidiary of Emerson Radio & Phonograph Corp., Newark, N. J.
Radiant Heat & Cooling Co., Santa Clara, Calif.
Ransome Co., Emeryville, Calif.
Ray Oil Burner Co., San Francisco, Calif.
Rayfield-Staffco Burner Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Riley Stoker Corp., Worcester, Mass.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Rockwell Co., W. S., Fairfield, Conn.
Sellers Engineering Co., Chicago, Ill.
Siemon Mfg. Co., Grandview, Mo.
Sonner Burner Co., Winfield, Kan.
Standard Fuel Engineering Co., Detroit, Mich.
Staples & Pfeiffer, San Francisco, Calif.
Stout & Sons, David, St. Louis, Mo.
Sullivan Valve & Engineering Co., Butte, Mont.
Superior Combustion Industries, Inc., New York, N. Y.
Surface Combustion Corp., Toledo, O.
Synchronous Flame, Inc., Walworth, Wis.
Timken Silent Automatic Div., Rockwell Spring & Axle Co., Jackson, Mich.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Vacuum Gas Burner, Olean, N. Y.
Webster Engineering Co., Tulsa, Okla.
Williams Div., Eureka Williams Corp., Bloomington, Ill.
Wisconsin Burners Inc., Madison, Wis.
York-Shipley, Inc., York, Pa.
Zink Co., John, Tulsa, Okla.
Zurn Mfg. Div., J. A., Zurn Industries, Inc., Erie, Pa.

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL, COMBINED WITH STOKER OR OVER COAL GRATES

Barber Mfg. Co., Cleveland, O.
Engineer Co., New York, N. Y.
Forney Engineering Co., Dallas, Tex.
Gordon & Piatt, Inc., Winfield, Kan.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Lientz Co., B. P., Kansas City, Mo.
Maxon Premix Burner Co., Muncie, Ind.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Mid-Continent Metal Products Co., Chicago, Ill.
Norman Products Co., Columbus, O.
Riley Stoker Corp., Worcester, Mass.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Webster Engineering Co., Tulsa, Okla.

BURNERS, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

Ace Engineering Co., Chicago, Ill.
Automatic Corp., St. Louis, Mo.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Coppus Engineering Corp., Worcester, Mass.
Eclipse Fuel Engineering Co., Rockford, Ill
Engineer Co., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., San Francisco, Calif.

Faber Engineering Co., Inc., Philadelphia, Pa.
Forney Engineering Co., Dallas, Tex.
Gordon & Piatt, Inc., Winfield, Kan.
Hauck Mfg. Co., Brooklyn, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Johnson Co., S. T., Oakland, Calif.
Lammert & Mann Co., Chicago, Ill.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
Maxon Premix Burner Co., Muncie, Ind.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Mid-Continent Metal Products Co., Chicago, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
National-U. S. Radiator Corp., Johnstown, Pa.
North American Mfg. Co., Cleveland, O.
Orr & Sembower, Inc., Reading, Pa.
Peabody Engineering Corp., New York, N. Y.
Petro, Cleveland, O.
Preferred Utilities Mfg. Corp., New York.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Ray Oil Burner Co., San Francisco, Calif.
Rayfield-Staffco Burner Co., Chicago, Ill.
Riley Stoker Corp., Worcester, Mass.
Roberts-Gordon Appliance Co., Buffalo, N. Y.
Rockwell Co., W. S., Fairfield, Conn.
Siemon Mfg. Co., Grandview, Mo.
Simplex Oil Heating Corp., Philadelphia, Pa.
Sonner Burner Co., Winfield, Kan.
Staples & Pfeiffer, San Francisco, Calif.
Stout & Sons, David, St. Louis, Mo.
Superior Combustion Industries, Inc., New York, N. Y.
Surface Combustion Corp., Toledo, O.
Synchronous Flame, Inc., Walworth, Wis.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Webster Engineering Co., Tulsa, Okla.
York-Shipley, Inc., York, Pa.
Zink Co., John, Tulsa, Okla.

BURNERS, NATURAL AND LP GAS, COMBINED, COMMERCIAL AND INDUSTRIAL

Burdett Mfg. Co., Chicago, Ill.
Bryant Industrial Products Corp., Cleveland, O.
Gordon & Piatt, Inc., Winfield, Kans.
Hauck Mfg. Co., Brooklyn, N. Y.
Kresky Mfg. Co., Petaluma, Calif.
Mid-Continent Metal Products Co., Chicago, Ill.
Mutual Liquid Gas & Equipment Co., Gardena, Calif.
Norman Products Co., Inc., Columbus, O.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Rockwell Co., W. S., Fairfield, Conn.
Sonner Burner Co., Winfield, Kans.

BURNERS, OIL, COMMERCIAL AND INDUSTRIAL

ABC-Federal Oil & Burner Co., Inc., Philadelphia, Pa. (rotary)
Ace Engineering Co., Chicago, Ill. (Rotary)
Aldrich Co., Wyoming, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Automatic Corp., St. Louis, Mo. (high pressure gun type)
Automatic Burner Corp., Chicago, Ill. (high pressure)
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Beckett Corp., R. W., Elyria, O. (high pressure)
Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Carlin Co., The, Wethersfield, Conn.
Century Engrg. Corp., Cedar Rapids, Ia. (high pressure atomizing)
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Delta Heating Corp., Trenton, N. J. (high pressure)
Diesel Oil Burner Corp. of New York, Jamaica, Long Island, N. Y.
Drying Systems, Inc., Chicago, Ill. (medium pressure atomizing)
Eckhart Mfg. Co., Inc., Union, N. J. (High pressure atomizing)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eds-Wil Burner Corp., Chicago, Ill.
Electrol Burner Mfg. Co., Inc., Rutherford, N. J. (high pressure atomizing)
Engineer Co., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., San Francisco, Calif. (rotary)
Faber Engineering Co., Inc., Philadelphia, Pa.
Forney Engineering Co., Dallas, Tex. (both steam atomizing & mechanical, high pressure)
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Haney Gas Burner & Engineers, Inc., Monrovia, Calif. (steam atomizing)
Hardinge Oil Burner & Mfg. Co., Chicago, Ill.
Hauck Mfg. Co., Brooklyn, N. Y. (low pressure air and high pressure steam)
Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.
Iron Fireman Mfg. Co., Cleveland, O. (Rotary atomizing, high pressure atomizing)
Jackson & Church Co., Saginaw, Mich.
Johnson Co., S. T., Oakland, Calif. (high pressure atomizing; horizontal rotary)
Kol-Master Corp., Oregon, Ill. (high pressure)
Kresky Mfg. Co., Inc., Petaluma, Calif. (hi-pressure atomizing; also forced-draft vaporizing retort-type)
Lammert & Mann Co., Chicago, Ill. (low pressure air or steam atomization)
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y. (horizontal rotary-belt & direct)
Leahy Mfg. Co., Los Angeles, Calif.
Lennox Industries, Inc., Marshalltown, Ia. (high pressure)
Lientz Co., B. P., Kansas City, Mo. (steam atomizing)
Maxon Premix Burner Co., Muncie, Ind.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif. (high pressure atomizing and steam atomizing)
Montag Inc., Portland, Ore.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa. (low pressure, high pressure, steam rotary)
National Oil Burner Co. of N. Y. Inc., Brooklyn, N. Y. (horizontal rotary)
North American Mfg. Co., Cleveland, O.
Nu-Way Corp., The, Rock Island, Ill.
Orr & Sembower, Inc., Reading, Pa. (air-atomizing) (Capacity range: 15 hp-500 hp. Fuels: Light oil, heavy oil or gas or any combination of these.)
Peabody Engrg. Corp., New York, N. Y.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (gun type; high pressure)
Petro, Cleveland, O. (high pressure and rotary atomizing)
Preferred Utilities Mfg. Corp., New York, N. Y., (Rotary types; from 7½ gph to 175 gph.)
Quiet Automatic Oil Burner Corp., Newark, N. J. (high pressure atomizing)
Quiet-Heet Mfg. Corp., Subsidiary of Emerson Radio & Phonograph Corp., Newark, N. J.
Radiant Utilities Corp., Brooklyn, N. Y. (high pressure)
Ray Oil Burner Co., San Francisco, Calif. (High pressure atomizing rotary)
Rayfield-Staffco Burner Co., Chicago, Ill. (low pressure atomizing and horizontal rotary)
Reif-Rexoil, Inc., Buffalo, N. Y. (pressure atomizing 75 to 30 gph. Horizontal rotary heavy oil or 165 gph.)
Riley Stoker Corp., Worcester, Mass.
Rockwell Co., W. S., Fairfield, Conn.
Schurs Oil Burner Co., Los Angeles, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silent Glow Oil Burner Co., Hartford, Conn.
Simplex Oil Heating Corp., Philadelphia, Pa. (Low and high pressure atomizing, and horizontal rotary types)
Staples & Pfeiffer, San Francisco, Calif. (High pressure and steam atomizing, variable capacity)
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind. (low and high pressure)
Stout & Sons, David, St. Louis, Mo.
Sun-Ray Burner Mfg. Corp., Jamaica, N. Y.
Superior Combustion Industries, Inc., New York, N. Y. (rotary)
Synchronous Flame, Inc., Walworth, Wis. (High pressure atomizing)
Timken Silent Automatic Div., Rockwell Spring & Axle Co., Jackson, Mich.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y. (Variable capacity, rotary, pressure atomizing, steam atomizing)
Utah Hydro Corp., Salt Lake City, Utah
Weatherall Engineers, Inc., Providence, R. I.
Webster Engineering Co., Tulsa, Okla.
Williams Div., Eureka Williams Corp., Bloomington Ill.
Wisconsin Burners Inc., Madison, Wis.
York-Shipley, Inc., York, Pa. (Rotary, high pressure atomizing)
Zink Co., John, Tulsa, Okla.

BURNERS, PULVERIZED COAL, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.
Whiting Corp., Harvey, Ill.

BURNERS, PULVERIZED COAL AND GAS, COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Foster Wheeler Corp., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

BURNERS, PULVERIZED COAL, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Engineer Co., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

BURNERS, PULVERIZED COAL AND OIL, COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Foster Wheeler Corp., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

CABINETS FOR AIR CONDITIONERS, BOILERS, ETC.

See Parts For Heating and Air Conditioning Equipment

CABLE, ELECTRIC HEATING

Ceilheat, Inc., Knoxville, Tenn.
Chester Cable Corp., Chester, N. Y.
Crystalheat Co., Van Nuys, Calif.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Everwarm, Inc., Knoxville, Tenn.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Miller Mfg. Co., St. Paul, Minn.
Modernheat Cable Corp., Kingsport, Tenn.
Preferred Utilities Mfg. Corp., New York, N. Y.
Roberson Co., L. N., Seattle, Wash.
S & C Mfg. Co., Cincinnati, O.
Sunwarm, Inc., Kingsport, Tenn.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wrap-On Co., Chicago, Ill.

CABLE AND WIRE, THERMOSTAT

Chester Cable Corp., Chester, N. Y.
Crystalheat Co., Van Nuys, Calif.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Roberson Co., L. N., Seattle, Wash.
United States Rubber Co., New York, N. Y.
Wiegand Co., Edwin L., Pittsburgh, Pa.

CALCULATORS, AIR CONDITIONING, HEATING, VENTILATING, AND PIPING; SLIDE RULE

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Instrument Co., Inc., Silver Spring, Md. (psychrometric calculator)
Armstrong Furnace Co., Div. of Union Electric Corp., Columbus, O.
Calculator Specialties Co., Chicago, Ill.
Caliputer, Rancho Sante Fe, Calif.
Graphic Calculator Co., Chicago., Ill.
Morton Engineering Service, Paul S., Lawrence, Mich. (Btu calculator, area and volume calculator and temperature difference convertor calculator. Area and crackage calculator Btuh calculator. Heat loss calculation & data sheets — padded)

CANOPIES, METAL, SUN, REFLECTING

American Warming & Ventilating Co., Toledo, O.
Kawneer Co., Niles, Mich.

CAPACITORS, ELECTRICAL, FOR POWER FACTOR CORRECTION

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Capacitor Dept., Hudson Falls, N. Y.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Mallory Co., P. R., Indianapolis, Ind.
Potter Co., The, North Chicago, Ill.
Sprague Electric Co., North Adams, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.

CAPILLARY TUBING

See Tubing, Capillary

CAPS, VENT FLUE

Accurate Sheet Metal & Mfg. Works, Chicago, Ill.
Acme Mfg. Co., Philadelphia, Pa.
Adams Co., The, Dubuque, Iowa
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Airjet Ventilator Co., San Clemente, Calif.
Ammerman Co., Inc., Minneapolis, Minn.
Boston Machine Works Co., Lynn, Mass.
Breidert Co., G. C., San Fernando, Calif.
Coleman Co., Inc., The, Wichita, Kan.
Corbman Bros., Inc., Philadelphia, Pa.
Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Ohio Foundry & Mfg. Co., Steubenville, O.
Oil Equipment Mfg. Corp., New Haven, Conn.
Penn Ventilator Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Robinson Clay Products Co., The, Akron, O.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Waverly Heating Supply Co., Boston, Mass.
Wood Mfg. Co., A. R., Luverne, Minn.

CARBON DIOXIDE ANALYZERS

See Analyzers, Carbon Dioxide, Portable

CARBON DIOXIDE INDICATORS

See Indicators, Carbon Dioxide, Boiler Room

CARBON PIPE, TUBING, FITTINGS AND VALVES

See Pipe, Tubing, Fittings and Valves, Carbon and Graphite

CAST IRON PIPE

See Pipe, Cast Iron

CATALOG HOLDERS AND FILES

See Holders and Files, Catalog

CEMENT AND COMPOUNDS, PIPE JOINT

Acorn Paint & Chemical Co., Cleveland, O.
Arco Co., The, Cleveland, O.
Armite Laboratories, Los Angeles, Calif.
Atlas Mineral Products Co., Mertztown, Pa.
Babbitt Chemical Co., New Bedford, Mass.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Black & White Chemical Co., New York, N. Y.
Blue Ridge Talc Co., Inc., Henry, Va.
Blue Seal Chemical Co., Roselle Park, N. J.
Cabot, Inc., Samuel, Boston, Mass.
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chicago Gasket Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Crane Packing Co., Morton Grove, Ill.
Croll & Son, Jesse G., Philadelphia, Pa.
Dixon Crucible Co., Joseph, Jersey City, N. J.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gasoilair Equipment Co., New Haven, Conn.
Gilbert & Barker Mfg. Co., West Spring, Mass.
Gilbreth Co., The, Philadelphia, Pa.
Goodrich Industrial Products Co., B. F., Akron, O.
Greene, Tweed & Co., North Wales, Pa.
Grinnell Co., Inc., Providence, R. I.
Hercules Chemical Co., Inc., New York, N. Y.
Horn Co., Inc., A. C., Long Island City, N. Y.
Industrial Plastic Fabricators, Norwood, Mass.
Jet-Lube, Inc., Burbank, Calif.
Johns-Manville, New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Keystone Asphalt Products Co., Chicago, Ill.
Lake Chemical Co., Chicago, Ill.
Lastik Products Co., Inc., Pittsburgh, Pa.
Macksons Co., New York, N. Y.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Montgomery Bros., San Francisco, Calif.
National Engineering Products, Inc., Washington, D. C.
Nebel Mfg. Co., Cleveland, O.
Parker Appliance Co., The, Cleveland, O.
Pecora Paint Co., Inc., Philadelphia, Pa.
Permatex Co., Inc., Brooklyn, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Quigley Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
Robinson Clay Product Co., The, Akron, O.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sauereisen Cements Co., Pittsburgh, Pa.
Saverite Engineering Co., Hoboken, N. J.
Sexauer Mfg. Co., Inc., J. A., New York, N. Y.
Smooth-On Mfg. Co., Jersey City, N. J.
Spring Packing Corp., Chicago, Ill.
Stewart Industries, Inc., Clifton, N. J.
Sulflo, Inc., Elizabeth, N. J.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
Tube Turns Plastics, Inc., Louisville, Ky. (PVC pipe)
United States Stoneware Co., New York, N. Y.
W-K-M Mfg. Co., Div. of ACF Industries, Inc., Houston, Tex.
Wilhelm Co., A., Reading, Pa.
X Laboratories, Inc., New York, N. Y.
X-Pando Corp., Long Island City, N. Y.

CEMENT, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Armstrong Co., Detroit, Mich.
Armstrong Cork Co., Lancaster, Pa.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Clinton Metallic Paint Co., Clinton, N. Y. (Asbestos)
France Refractories Co., J. H., Snow Shoe, Pa.
Grant Wilson, Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
Hercules Chemical Co., Inc., New York, N. Y.
Johns-Manville, New York, N. Y.
Lastik Products Co., Inc., Pittsburgh, Pa.
Nebel Mfg. Co., Cleveland, O.
Norton Co., Worcester, Mass.
Pecora Paint Co., Inc., Philadelphia, Pa.
Plastic Products Co., Detroit, Mich.
Plibrico Co., Chicago, Ill.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Refractory & Insulation Corp., New York, N. Y.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O.
Sauereisen Cements Co., Pittsburgh, Pa.
Smooth-On Mfg. Co., Jersey City, N. J.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
Taylor Sons Co., Charles, Cincinnati, O.

CEMENT, INSULATING

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Atlas Mineral Products Co., Mertztown, Pa.
Baldwin-Hill Co., Trenton, N. J. (mineral wool)
Bigelow Liptak Corp., Detroit, Mich.
Bird-Archer Co., Philadelphia, Pa.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Eagle-Picher Co., Cincinnati, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Fibreboard Paper Products Corp., San Francisco, Calif.
Foster Co., Benjamin, Philadelphia, Pa.
France Refractories Co., J. H., Snow Shoe, Pa.
Grant Wilson, Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
International Vermiculite Co., Girard, Ill.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa. (85 per cent magnesia)
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Moore, Inc., Goodloe E., Danville, Ill.
Mortell Co., J. W., Kankakee, Ill.
Mundet Cork Corp., North Bergen, N. J.
Munn and Steele, Inc., South Boston, Mass.
National Engineering Products, Inc., Washington, D. C.
National Gypsum Co., Buffalo, N. Y.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
North American Asbestos Corp., Chicago, Ill.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Plibrico Co., Chicago, Ill.
Poe Co., C. W., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Refractory & Insulation Corp., New York, N. Y.
Rex Clay Products Co., Detroit, Mich.
Ruberoid Co., New York, N. Y.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O.
Sauereisen Cements Co., Pittsburgh, Pa.
Smith & Kanzler Corp., Linden, N. J.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.
United States Mineral Wool Co., Stanhope, N. J.
Zonolite Co., Chicago, Ill.

CENTRIFUGAL PUMPS

See Pumps, Centrifugal

CHAIN DRIVES

See Drives, Chain

CHAMBERS, COMBUSTION, PREFORMED

Armstrong Cork Co., Lancaster, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Bemco, Inc., North Hollywood, Calif.
Boston Machine Works Co., Lynn, Mass.
France Refractories Co., J. H., Snow Shoe, Pa.
Grant Wilson, Inc., Chicago, Ill.

Green Fire Brick Co., Mexico, Mo.
Insul-Lyte Corp., A Div. of Plibrico Co., River Rouge, Mich.
Monogram Products Co., Inc., Philadelphia, Pa.
Munn & Steele, Inc., South Boston, Mass.
Oil Equipment Mfg. Corp., New Haven, Conn.
Preferred Utilities Mfg. Corp., New York, N. Y.
Refractory & Insulation Corp., New York, N. Y.
Rex Clay Products Co., Detroit, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.

CHAMBERS, TEST, CONTROLLED TEMPERATURE AND HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Anetsberger Brothers, Inc., Northbrook, Ill.
Drying Systems, Inc., Chicago, Ill.
Reco Products Div., Recony Corp., New York, N. Y.
Sub-Zero Freezer Co., Inc., Madison, Wis.
Tenney Engineering, Inc., Union, N. J.
Thompson Research & Mfg. Co., Davenport, Fla.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

CHANGERS, SPEED, HYDRAULIC COUPLING

American Blower Corp., Detroit, Mich.
CraneVeyor Corp., Los Angeles, Calif.
Reuland Electric Co., Alhambra, Calif. (combined electric motor and fluid drive coupling)
Twin Disc Clutch Co., Rockford, Ill.

CHANGERS, SPEED, MAGNETIC

Allis Co., Louis, The, Milwaukee, Wis.
Doerr Electric Corp., Cedarburg, Wis.
Electric Machinery Mfg. Co., Minneapolis, Minn.
Janette Electric Mfg. Co., Morton Grove, Ill.

CHANGERS, SPEED, MECHANICAL

Abart Gear & Machine Co. Chicago, Ill.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Allis Co., Louis, The, Milwaukee, Wis.
American Flexible Coupling Div., Zurn Industries, Inc., Erie, Pa. (synchronizing friction clutch)
Chicago Die Casting Mfg. Co., Chicago, Ill.
Cleveland Worm & Gear Co., Cleveland, O.
DoAll Co., The, Des Plaines, Ill.
Dodge Mfg. Corp., Mishawaka, Ind.
Doerr Electric Corp., Cedarburg, Wis.
Driv-Way Lite Co., Denver, Colo.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Horton Mfg. Co., Inc., Minneapolis, Minn.
Lewellen Mfg. Co., Columbus, Ind.
Lima Electric Motor Co., The, Lima, O.
Link Belt Co., Chicago, Ill.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Master Electric Co., Dayton, O.
Maurey Mfg. Corp., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Reeves Pulley Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind.
Reliance Electric & Engineering Co., Cleveland, O. (electrical & mechanical drives)
Sealmaster Bearings, Div of Stephens-Adamson Mfg. Co., Aurora, Ill.
Speed Selector Inc., Chagrin Falls, O.
Standard Transmission Equipment Co., Pasadena, Calif.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Woods Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J.

CHASERS, PIPE AND BOLT

Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.

CHASERS, THREADING DIE

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Armstrong Bros Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Erie Tool Works, Erie, Pa.
Greenfield Tap & Die Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.

CHECK VALVES

See Valves, Check

CHILLERS, WATER, FOR AIR CONDITIONING AND REFRIGERATION

Acme Industries, Inc., Jackson, Mich.
Alstrom Corp., New York, N. Y.
American Coils Co., Newark, N. J.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Armstrong Co., Richard M., Westchester, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., The, Elyria, O.
Brown Products Corp., Forest Hills, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Coleman Co., Inc., The, Wichita, Kans.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., Somerville, Mass.
Davis Engineering Corp., Elizabeth, N. J.
Dole Refrigeratng Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Frick Co., Waynesboro, Pa.
Graham Mfg. Co., Inc., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Hydrotherm, Inc., Northvale, N. J.
Kennard Corp., St. Louis, Mo.
King Zeero Co., The, Chicago, Ill.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Mayer Refrigerating Engineers, Inc., Lincoln Park, N. J.
Niagara Blower Co., New York, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Servel, Inc., Evansville, Ind.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Temprite Products Corp., Dept HPAC, Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Vic Mfg. Co., Minneapolis, Minn.
Vilter Mfg. Co., The, Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Co., W. Hartford, Conn.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Yula Water Heaters, Inc., Bronx, N. Y.

CHILLERS, WATER, PACKAGED

See Compressors, Refrigerating, Combined with Condenser, Water Chiller, Piping Connections and Controls

CHIMNEYS, PREFABRICATED

See Stacks and Chimneys, Industrial, Prefabricated

CHLORINATORS, WATER

Aquatrol Ferr-X Corp., Clifton, N. J.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Culligan, Inc., Northbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Wallace & Tiernan Inc., Belleville, N. J.

CIRCULATORS FOR HOT WATER HEATING SYSTEMS

Alliance Industries, Huntingdon Valley, Pa.
Baseline Mfg. Corp., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Columbus Steam Pump Works Co., Columbus, O.
Corley Co., Inc., The, Plainville, Conn. (magnetically driven)
Dayton Electric Mfg. Co., Chicago, Ill.
Dunham-Bush, Inc., Hartford, Conn.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Fairbanks, Morse & Co., Chicago, Ill.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Hoffman Specialty Mfg. Corp., Indianapolis.
Kehm Corp., The, Chicago, Ill.
Kraissl Co., Inc., The, Hackensack, N. J.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Pumpenbay Brugg K. Rutschi, Brugg, Switzerland
Quality Specialty Co., Inc., Camden, N. J.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Weil Pump Co., Chicago, Ill.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
White Flomatic Corp., Hoosick Falls, N. Y.

CLAMPS, BEAM, PIPE HANGING

Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Carpenter & Paterson, Inc., Cambridge, Mass.
Crawford Co., Chicago, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Frick Co., Waynesboro, Pa.
Gateway Engineering Co., Chicago, Ill.
Globe Products, Huppower Div., Hupp Corp., Detroit, Mich.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Providence, R. I.
Holub Industries, Inc., Sycamore, Ill.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Moore, Inc., Goodloe E., Danville, Ill.
Mult-A-Frame Div., Ainsworth Mfg. Corp., Detroit, Mich.
National Valve & Mfg. Co., Pittsburgh, Pa.
Paine Co., Addison, Ill.
Rockwood Sprinkler Co., Worcester, Mass.
Steel City Electric Co., Pittsburgh, Pa.
Unistrut Products Co., Chicago, Ill.

CLAMPS, HOSE

Allen Mfg. Co., W. D., Chicago, Ill.
Baker & Co., R. H., Huntington Park, Calif.
Binks Mfg. Co., Chicago, Ill.
Breeze Corporations, Inc., Union, N. J.
Chicago Pneumatic Tool Co., New York, N. Y.
Circle Clamp Corp., New York, N. Y.
Continental Rubber Wks., Erie, Pa.
Crane Co., Chicago, Ill.
Flexible Tubing Corp., Guilford, Conn.
Goodall Rubber Co., Trenton, N. J.
Hansen Mfg. Co., Cleveland, O.
Holub Industries, Inc., Sycamore, Ill.
Ideal Corp., Brooklyn, N. Y.
LE-HI Div., Hose Accessories Co., Philadelphia, Pa.

Manufacturers Corp., Mansfield, O.
Marman Products Co., Inc., A Subsidiary of Aeroquip Corp., Los Angeles, Calif.
Punch-Lok Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Richland Co., Mansfield, O.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Thor Power Tool Co., Aurora, Ill.
Tinnerman Products, Inc., Cleveland, O.
Wittek Manufacturing Co., Chicago, Ill.

CLAMPS, PIPE REPAIR

Adams Pipe Repair Products, El Monte, Calif.
Atlas Industries, Inc., Houston, Tex.
Chelsea Metal Stamping Co., New York, N. Y.
Chicago Specialty Mfg. Co., Chicago, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Holub Industries, Inc., Sycamore, Ill.
Ideal Corp., Brooklyn, N. Y.
Inner-Tite Div. of Yara Engineering Corp., Elizabeth, N. J.
Ludlow Valve Mfg. Co., Inc., The, Rensselaer Valve Div., Troy, N. Y.
Marman Products Co., Inc., A Subsidiary of Aeroquip Corp., Los Angeles, Calif.
Morris Coupling & Clamp Co., Kittanning, Pa.
Paine Co., Addison, Ill.
Pipe Line Development Co., Cleveland, O.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
Skinner Co., M. B., South Bend, Ind.
Smith-Blair, Inc., South San Francisco, Calif.
Yarnall-Waring Co., Philadelphia, Pa.

CLAMPS, PIPE, WELDING

Adjustable Clamp Co., Chicago, Ill.
Albert Pipe Supply Co., Brooklyn, N. Y.
Atlas Welding Accessories Inc., Ferndale, Mich.
Billings & Spencer Co., Hartford, Conn.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Detroit Stamping Co., Detroit, Mich.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Jewel Mfg. Co., St. Paul, Minn.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Trindl Products, Ltd., Chicago, Ill.
Williams & Co., J. H., Buffalo, N. Y.

CLEANERS, AIR, ELECTRICAL

See Filters, Air, Electrostatic (with outside power source)

CLEANERS, PIPE LINE, ELECTRICALLY DRIVEN

Ken-Way Corp., Sparta, Wis.
Spartan Tool Co., Chicago, Ill.

CLEANERS, TUBE

Arcee Products, Pawtucket, R. I. (copper fitting cleaning tool)
Chesterton Co., A. W., Everett, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Elliott Co., Jeannette, Pa.
Mill-Rose Co., Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Osborn Mfg. Co., Cleveland, O.
Pierce Co., Wm. B., The, Buffalo, N. Y.
Pilley Brush Co., Fort Madison, Ia.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Spencer Turbine Co., Hartford, Conn.
Wilson, Inc., Thomas C., Long Island City, N. Y.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

CLEANERS, VACUUM, FOR BOILERS

Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Empire Chemical Products Co., Newark, N. J.
Holub Industries, Inc., Sycamore, Ill.
Ideal Industries, Inc., Sycamore, Ill.
Kent Co., Inc., Rome, N. Y.
National Super Service Co., Inc., Toledo, O.
Premier Co., St. Paul, Minn.
Pullman Vacuum Cleaner Co., Boston, Mass.
Spencer Turbine Co., Hartford, Conn.

CLEANING COMPOUNDS

See Compounds, Cleaning, Pipe Coil and Condenser

CLEANING COMPOUNDS, AIR FILTER

See Compounds, Cleaning, Air Filter

CLEANING MACHINES, PIPE

See Machines, Pipe Cleaning; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

CLOTH, TREATED, FOR DUST COLLECTORS

American Felt Co., Glenville, Conn.
Canvas Products Co., St. Louis, Mo.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Menardi & Co., El Segundo, Calif.

CLUTCHES, HYDRAULIC

See Drives, Fluid or Hydraulic, for Power Transmission

COAL BURNERS

See Burners, Pulverized Coal; Stokers

COAL CONVEYORS

See Conveyors, Coal and Ash

COATINGS, PROTECTIVE, FOR METALS

Allied Porcenell, Inc., Waukegan, Ill. (vitreous enamel coatings)
Alrose Chemical Co., Providence, R. I.
Amercoat Corporation, South Gate, Calif. (zinc, vinyl)
American Chemical Paint Co., Ambler, Pa. (rust proofing chemicals)
American Hard Rubber Co., New York, N. Y. (rubber and plastic)
American Solder & Flux Co., Philadelphia, Pa. (Galvanizing powder)
Armstrong Cork Co., Lancaster, Pa. (asphalt for weather & low temperatures)
Atlas Mineral Products Co., Mertztown, Pa. (plastic)
Barreled Sunlight Paint Co., Providence, R. I.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (Pitchbase and asphaltbase)
Bart Mfg. Corp., Belleville, N. J.
Blue Ridge Talc Co., Inc., Henry, Va.
Brooklyn Paint & Varnish Co., Inc., Brooklyn, N. Y.
Cabot Inc., Samuel, Boston, Mass. (Bituminous black paint)
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carboline Co., The, St. Louis, Mo. (corrosion resisting)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asphalt and aluminum paints for roofs)
Chemical Coatings & Engineering Co., Edgemont, Pa.
Chemical Solvent Co., Birmingham, Ala. (liquid)
Condenser Service & Engineering Co., Inc., Hoboken, N. J. (Metal spray)
Continental Products Co., Euclid, O. (paint)
Cordo Chemical Corp., Norwalk, Conn.
Corite Products, Inc., Chicago, Ill. (plastic)
Corrosion Control Co., Inc., New York, N. Y.
Corrosite Div., Reliance Paint Co., Brooklyn, N. Y. (vinyl plastic)
Corro-Vent, Inc., Cincinnati, O. (plastic)
Dampney Co. of America, Boston, Mass.
Dearborn Chemical Co., Chicago, Ill. (Rust preventive)
Debevoise Co., The, Brooklyn, N. Y.
Dennis Chemical Co., St. Louis, Mo.
Dow Corning Corp., Midland, Mich.
du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Eagle-Picher Co., Cincinnati, O.
Elraco Engineering Co., Los Angeles, Calif. (interior tank paint)
Emjay Maintenance Engineers, Rutherford, N. J.
Ervite Corp., Erie, Pa. (porcelain enamel)
Flexrock Co., Philadelphia, Pa.
Flintkote Co., The, New York, N. Y. (Asphalt emulsions)
Flood Co., Hudson, O. (paint additive)
Foster Co., Benjamin, Philadelphia, Pa.
France Refractories, Co., J. H., Snow Shoe, Pa. (cast iron & steel)
Garlock Packing Co., Palmyra, N. Y. (cementable teflon)
Gates Engineering Co., Wilmington, Del.
Glidden Co., The, Cleveland, O.
Goodall Rubber Co., Trenton, N. J. (liquid Neoprane)
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O. (rubber)
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Harco Corp., Bedford, O. (corrosion protection for underground piping, process tanks, storage tanks, and radiant heating piping)
Heresite & Chemical Co., Manitowoc, Wis. (Synthetic rubber and phenolic coatings, baking type)
Hill, Hubbell & Co., Cleveland, O. (coating and wrapping for steel pipe)
Horn Co., Inc., A. C., Long Island City, N. Y.
Houghton & Co., E. F., Philadelphia, Pa.
Industrial Metal Protectives, Inc., Dayton, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Insul-Mastic Corp. of America, Summit, Ill. (asphaltic & plastic)
Interchemical Corp., Finishes Div., Newark, N. J.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Kellogg Co., M. W., The, New York, N. Y. (Heat resisting)
Kendall Co., Polyken Sales Div., Chicago, Ill. (tape, plastic)
Knight, Maurice A., Akron, O. (Vinyl plastic base)
Koppers Co., Inc., Pittsburgh, Pa. (coal tar)
LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (rubber, PVC, neoprene)
Lastik Products Co., Inc., Pittsburgh, Pa.
Lithcote Corp., Melrose Park, Ill. (baked phenolic epoxy vinyl neoprene, rubber)
Maas & Waldstein Co., Newark, N. J.
Master Mechanics Co., Cleveland, O.
Metal & Thermit Corp., Rahway, N. J. (plastisol-vinyl phenolic)
Metalweld, Inc., Protective Coatings Div., Philadelphia, Pa. (linings for hot water tanks)
Midland Paint & Varnish Co., Cleveland, O.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Detroit, Mich. (Sound dampening and insulating types as well as for protection against corrosion)
Miracle Adhesives Corp., Bellmore, N. Y. (anti-corrosive paint)
Moore & Co., Samuel, Mantau, O. (plastic)
Mortell Co., J. W., Kankakee, Ill. (Asphalt)
National Lead Co., New York, N. Y. (Red lead)
National Pipe Coatings, Inc., Huntington Park, Calif.
Nebel Mfg. Co., Cleveland, O.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
Niphos Process Sales Corp., New York, N. Y. (ferrous)
Novelty Steam Boiler Works, Inc., Baltimore, Md.
Oakite Products, Inc., New York, N. Y. (phosphate, chromate)
Octagon Process, Inc., Staten Island, N. Y. (rust preventive oils, rust-proofing compounds)
Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y. (Acid resistant, heat resistant)
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa. (cement)
Penn Galvanizing Co., Philadelphia, Pa. (Galvanizing)
Pennsylvania Salt Mfg. Co., Philadelphia, Pa. (chlorinated hydrocarbon base, and liquid neoprene base)
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (Paint, varnish, lacquer)
Poe Co., C. W., The, Cleveland, O.
Polymer Corp., The, Reading, Pa. (plastic)
Porce-Lin Tank Lining Co., Detroit, Mich.
Presstite-Keystone Engineering Products Co., A Div. of American-Marietta Co., St. Louis, Mo.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Reilly Tar & Chemical Corp., Indianapolis, Ind. (Coal tar base)
Rhopac, Inc., Skokie, Ill. (pipe insulation)
Robertson Co., H. H., Pittsburgh, Pa. (bituminous)

Rotometals, San Francisco, Calif. (galvanizing repair stick)
Rubber & Plastics Compound Co., New York, N. Y. (anticorrosive coating)
Rust-Oleum Corp., Evanston, Ill.
Saran Lined Pipe Co., Ferndale, Mich.
Saverite Engineering Co., Hoboken, N. J. (Tank coatings, rust preventive)
Sealed Unit Parts Co., Inc., Bronx, N. Y. (liquid)
Sherwin-Williams Co., The, Cleveland, O.
Shutt Process Equipment Corp., St. Louis, Mo.
Solar Aircraft Co., San Diego, Calif. (ceramic)
Solfo Paint Mfg. Co., Metco Div., Trenton, N. J.
Sonneborn Sons, Inc., L., New York, N. Y.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga. (Metallic paint)
Special Chemicals Corp., Ossining, N. Y. (Aluminum paint)
Standard Oil Co. of California, San Francisco, Calif.
Steelcote Mfg. Co., St. Louis, Mo.
Surface Chemicals, Inc., McKees Rocks, Pa. (plastic)
Tapecoat Co., The, Evanston, Ill. (coal tar protective coating in tape form, for pipe, and pipe joints, pipe fittings, insulated pipe, both underground and above ground)
Thompson and Co., Oakmont, Pa.
Tropical Paint Co., Cleveland, O. (priming paint for iron & zinc)
Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich. (alkyd and epoxy resin)
Turco Products, Inc., Los Angeles, Calif.
United States Rubber Co., New York, N. Y. (rubber plastic, liquid plastic)
United States Stoneware Co., New York, N. Y. (Corrosion resistant)
United States Stoneware Co., Plastics & Synthetics Div., Akron, O. (vinyls)
Vimasco Corp., Nitro, W. Va. (vinyl)
Watson-Standard Co., Pittsburgh, Pa.
Wilbur & Williams Co., Brighton, Mass.
Wilhelm Co., A., Reading, Pa.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

COCKS, BOILER GAGE

Bordo Co., Inc., L. J., Glenside, Pa.
Crane Co., Chicago, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Ernst Water Column & Gauge Co., Livingston, N. J.
Heresite & Chemical Co., Manitowoc, Wis.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Nason Co., Clarkston, Mich.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
Reliance Gauge Column Co., Cleveland, O.
Shank Co., Cyrus, Chicago, Ill.
Strahman Valves, Inc., New York, N. Y.
Swift Lubricator Co., The, Elmira, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Wright-Austin Co., Detroit, Mich.

COILS, CONDENSATION

Albert Pipe Supply Co., Brooklyn, N. Y.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
Buxton Mfg. Co., Dover, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
General Ceramics Corp., Keasbey, N. J. (ceramic and plastic)
General Fittings Co., East Greenwich, R. I.
Heatron, Inc., York, Pa.
Lewis & Saunders, Lakeport, N. H.
Parker Appliance Co., The, Cleveland, O.
Trane Co., The, La Crosse, Wis.
Vilter Mfg. Co., The, Milwaukee, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

COILS, FINNED

See Surface, Cooling; Surface, Heating

COILS, FOR HOT WATER STORAGE TANKS

Adams Co., The, Dubuque, Ia.
Alstrom Corp., New York, N. Y.
American Cooling Tower Co., Kansas City, Mo.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Beltran Associates, Inc., Brooklyn, N. Y.
Buxton Mfg. Co., Dover, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dormont Mfg. Co., Pittsburgh, Pa.
General Fittings Co., East Greenwich, R. I.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp., Kewanee, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
National Pipe Bending Co., New Haven, Conn.
Novelty Steam Boiler Wks., Inc., Baltimore, Md.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Rempe Co., Chicago, Ill.
Republic Products Co., Philadelphia, Pa.
Richmond Engineering Co., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Western Piping & Engineering Co., San Francisco, Calif.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Water Heaters, Inc., Bronx, N. Y.

COILS AND PANELS, RADIANT HEATING AND COOLING, PREFABRICATED

Albert Pipe Supply Co., Brooklyn, N. Y.
Alstrom Corp., New York, N. Y.
American Brass Co., Waterbury, Conn.
Atlantic Pipe Bending and Fabricating Corp., Wood-Ridge, N. J.
Burgess-Manning Co., Architectural Products Div., Chicago, Ill. (also for radiant cooling)
Capitol Mfg. & Supply Co., Columbus, O.
Clow & Sons, Inc., James B., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Elmwood, Conn.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Fricke, Fred J., Albuquerque, N. M.
Heat & Power Corp., Baltimore, Md.
Hi-Flow Products, Inc., Copiague, N. Y.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
Nesbitt, Inc., John J., Philadelphia, Pa.
Olin Mathieson Chemical Corp., Western Brass Mills Div., East Alton, Ill. (roll bonded metal panels incorporating fluid passages)
Price Brothers, Dayton, O. (concrete slabs with openings for air travel or for hot water coils)
Radiant Heat and Cooling Co., Santa Clara, Calif.
Radiant Panel Mfg. Co., Torrington, Conn.
Reflectotherm, Inc., Cincinnati, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Simplex Ceiling Corp., New York, N. Y.
Taylor Engineering Corp., Detroit, Mich.
Tranter Mfg. Inc., Lansing, Mich.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Wallace Supplies Mfg. Co., Chicago, Ill.

COILS, PIPE

Albert Pipe & Supply Co., Brooklyn, N. Y.
American Cooling Towers Co., Kansas City, Mo.
Atlantic Pipe Bending and Fabricating Corp., Wood-Ridge, N. J.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Nipple Mfg. Co., Cicero, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Elmwood, Conn.
Corning Glass Works, Corning, N. Y.
Crane Co., Chicago, Ill.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y. (lead, lead covered, and lead alloy)
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Flori Pipe Co., The, St. Louis, Mo.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Harris & Co., Arthur, Chicago, Ill.
Heil Process Equipment Corp., Cleveland, O. (Impervious Graphite)
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kopperman & Sons, Joseph, Philadelphia, Pa.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead covered)
Lewis & Saunders, Lakeport, N. H.
Marlo Coil Co., St. Louis, Mo.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
National Pipe Bending Co., New Haven, Conn.
Niagara Blower Co., New York, N. Y.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Philadelphia Pipe Bending Co., Philadelphia.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Shaw-Kendall Engineering Co., Toledo, O.
Taylor Engineering Corp., Detroit, Mich.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Wallace Supplies Mfg. Co., Chicago, Ill.
Walworth Co., New York, N. Y.
Western Piping & Engineering Co., Inc., San Francisco, Calif.
Whitlock Mfg. Co., W. Hartford, Conn.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

COLLECTION, DUST AND FUME, ULTRASONIC

Ultrasonic Corp., Cambridge, Mass.

COLLECTORS, DUST

Aerotec Corp., The, Greenwich, Conn. (mechanical and electrical)
Aget-Detroit Co., Ann Arbor, Mich.
Allington & Curtis Mfg. Co., Saginaw, Mich (centrifugal & bag)
American Air Filter Co., Inc., Louisville, Ky.
American Blow Pipe Co., Chicago, Ill. (shavings and sawdust, wet and dry type, buffing and polishing)
American Blower Corp., Detroit, Mich.
Baker Co., Inc., Maplewood, Me. (portable)
Banister Co., Inc., Cambridge, Mass. (centrifugal-dry and wet)
Blower Application Co., Milwaukee, Wis.
Bubar Dust Systems, Old Lyme, Conn. (mechanical)
Buell Engineering Co., Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y. (wet & dry)

Carolina Blower Co., Inc., Greensboro, N. C. (cyclone)
Centri-Spray Corp., Livonia, Mich. (Wet type)
Chicago Blower Corp., Franklin Park, Ill. (centrifugal)
Cincinnati Electrical Tool Co., The, Cincinnati, O. (self contained)
Clark Dust Control Co., Chicago, Ill.
Day Co., The, Minneapolis, Minn.
Ducon Co., The, Mineola, N. Y. (Cyclone, centrifugal wash, and bag type)
Dust Filter Co., Chicago, Ill. (wet)
Dust Suppression & Engineering Co., Lake Orion, Mich.
Dustex Corp., Buffalo, N. Y. (mechanical)
Empire Chemical Products Co., Newark, N. J.
Farr Co., Los Angeles, Calif. (cyclonic)
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Goethel Sheet Metal Wks., Inc., Alfred, Milwaukee, Wis.
Green Fuel Economizer Co., Beacon, N. Y. (dry type)
Griffin & Co., Inc., Louisville, Ky. (cyclone)
Johnson March Corp., Philadelphia, Pa.
Kice Metal Products Co., Wichita, Kans.
Kirk & Blum Mfg. Co., Cincinnati, O.
Koppers Company, Inc., Metal Products Div., Baltimore, Md. (electrostatic)
Lumm Co., A. H., Toledo, O.
Mahon Co., R. C., The, Detroit, Mich. (dry inertia, air washers, fog filters)
National Dust Collector Corp., Chicago, Ill. (wet type)
Newcomb-Detroit Co., Detroit, Mich. (recirculating spray tube)
Northern Blower Co., Cleveland, O.
Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I. (bag type)
Pangborn Corp., Hagerstown, Md. (cloth filter and wet type)
Peabody Engineering Corp., New York, N. Y. (wet)
Peters-Dalton, Inc., Detroit, Mich.
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Research-Cottrell, Inc., Bound Brook, N. J. (electrostatic & mechanical)
Ruemelin Mfg. Co., Milwaukee, Wis. (cloth bag type)
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Schmieg Industries, Inc., Detroit, Mich. (wet type)
Schneible Co., Claude B., Detroit, Mich. (wet type)
Shutt Process Equipment Co., St. Louis, Mo.
Sly Mfg. Co., W. W., Cleveland, O. (cloth bag type)
Spencer Turbine Co., Hartford, Conn.
Sprout-Waldron & Co., Muncy, Pa.
Torit Mfg. Co., St. Paul, Minn. (cloth filter and centrifugal separator)
United Sheet Metal Co., Inc., Columbus, O. (cyclone)
Universal Gear Works, Inc., Detroit, Mich. (for portable industrial applications)
Vacu-Blast Co., Inc., Belmont, Calif. (wet type)
Wagner Awning & Mfg. Co., Cleveland, O. (Dust recovery bags)
Western Blower Co., Seattle, Wash.
Western Precipitation Corp., Los Angeles, Calif.
Wheelabrator Corp., Mishawaka, Ind. (cloth-tube type)
Winkler & Sons, Inc., A. E., Milwaukee, Wis. (cyclone)
Young & Bertke Co., Cincinnati, O. (cyclone type)
Zack Co., The, Chicago, Ill.

COLORIMETERS

American Instrument Co., Inc., Silver Spring, Md.
Bausch & Lomb Optical Co., Rochester, N. Y.
Ellison Draft Gage Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Will Corp., Rochester, N. Y.

COMBUSTION CHAMBERS

See Chambers, Combustion, Preformed

COMBUSTION CONTROL

See Controls, Draft, Barometric; Regulators, Draft, Combustion; Systems, Combustion Control

COMBUSTION RECORDERS

See Recorders, Carbon Dioxide

COMBUSTION TESTING KITS

See Kits, Combustion Testing; Analyzers, Carbon Dioxide, Portable; Testers, Smoke

COMPOUNDS, AIR FRESHENING

Aireactor Corp., New York, N. Y.
Airkem, Inc., New York, N. Y.
Ampion Corp., Long Island City, N. Y.
Barnebey-Cheney Co., Columbus, O.
Carbide and Carbon Chemicals Co., A Division of Union Carbide and Carbon Corp., New York, N. Y.
Easton R. S. Corp., Brooklyn, N. Y.
Lord & Clark Co., Inc., Boston, Mass.
Solvay Process Div., Allied Chemical & Dye Corp., New York, N. Y.

COMPOUNDS, ANTI-FREEZE, FOR SNOW MELTING COILS

Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Commercial Solvents Corp., New York, N. Y.
Dow Chemical Co., The, Midland, Mich.
Socony-Mobil Oil Co., Inc., New York, N. Y.

COMPOUNDS, BOILER CLEANING

Agava Products, Inc., Jersey City, N. J.
Agnew & Tomlinson, Long Island City, N. Y.
American Chemical Paint Co., Ambler, Pa.
American K. A. T. Corp., Garwood, N. J.
American Sand-Banum Co., Inc., Freeport, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Calgon, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Continental Products Co., Euclid, O.
Dearborn Chemical Co., Chicago, Ill.
Dowell Inc., Tulsa, Okla.
Drew & Co., Inc., E. F., New York, N. Y.
duPont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington, Del.
Elraco Engineering Co., Los Angeles, Calif.
Hagan Corp., Pittsburgh, Pa.
Hercules Chemical Co., Inc., New York, N. Y.
Houghton & Co., E. F., Philadelphia, Pa.
Kenite Laboratory, Inc., Madison, N. J.
Kewanee-Ross Corp., Kewanee, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
McMillan Industrial Supplies, C. C., Portland, Ore.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Moreheat Distribution, Inc., Cincinnati, O.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Octagon Process, Inc., Staten Island, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Permutit Co., New York, N. Y.
Perolin Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond, Cleveland, O.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Warren Refining & Chemical Co., The, Cleveland, O.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Co. of America, Pittsburgh, Pa.
X Laboratories, Inc., New York, N. Y.

COMPOUNDS, BOILER AND RADIATOR SEALING

Ampion Corp., Long Island City, N. Y.
Arco Co., The, Cleveland, O.
Black & White Chemical Co., New York, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Cannon Chemical Co., Inc., Cambridge, Mass.
Chemical Solvent Co., Birmingham, Ala.
Eagle-Picher Co., Cincinnati, O.
Hampton-Cross Co., The, Louisville, Ky.
Hercules Chemical Co., Inc., New York.
Johns-Manville, New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Engineering Products, Inc., Washington, D. C.
Quigley Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Sulflo, Inc., Elizabeth, N. J.
X Laboratories, Inc., New York, N. Y.

COMPOUNDS, CLEANING, AIR FILTER

Airkem, Inc., New York, N. Y.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.
Cuno Engineering Corp., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Homestead Valve Mfg. Co. Coraopolis, Pa.
Madden Corp., Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Montgomery Chemical Co., Jenkintown, Pa.
National Aniline Div., Allied Chemical & Dye Corp., New York, N. Y.
Oakite Products, Inc., New York, N. Y.
Trion, Inc., McKees Rocks, Pa.
Turco Products, Inc., Los Angeles, Calif.

COMPOUNDS, CLEANING, PIPE COIL AND CONDENSER

Agava Products, Inc., Jersey City, N. J.
Airkem, Inc., New York, N. Y.
American Chemical Paint Co., Ambler, Pa.
American Sand-Banum Co., Inc., Freeport, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Blue Seal Chemical Co., Roselle Park, N. J.
Calgon, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carolina Aniline & Extract Co., Inc., Charlotte, N. C.
Chemical Solvent Co., Birmingham, Ala.
Dearborn Chemical Co., Chicago, Ill.
Dowell, Inc., Tulsa, Okla.
Elraco Engineering Co., Los Angeles, Calif.
Garman Co., Inc., The, St. Louis, Mo. (also for pumps, condensers, etc.)
Hercules Chemicals Co., Inc., New York, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Aniline Div., Allied Chemical & Dye Corp., New York, N. Y.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Octagon Process, Inc., Staten Island, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Perolin Co., Inc., New York, N. Y.
Petroleum Solvents Corp., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Strong, Carlisle & Hammond, Cleveland, O.
Turco Products, Inc., Los Angeles, Calif.
Water Treatment Co. of America, Pittsburgh, Pa.

COMPOUNDS, WELDING

Allen Co., Inc., L. B., Chicago, Ill.
Allied Weld-Craft, Inc., Indianapolis, Ind.

All-State Welding Alloys Co., Inc., White Plains, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Solder & Flux Co., Philadelphia, Pa.
Atlas Welding Accessories Inc., Ferndale, Mich.
Eutectic Welding Alloys Corp., Flushing, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Metal & Thermit Corp., Rahway, N. J.
Midland Paint & Varnish Co., Cleveland, O.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif.
Modern Engineering Co., St. Louis, Mo.
Presstite-Keystone Engineering Products Co., A Div. of American-Marietta Co., St. Louis, Mo.
Sight Feed Generator Co., West Alexandria, O.
Solar Aircraft Co., San Diego, Calif.
Special Chemicals Corp., Ossining, N. Y.
Stainless Processing Div., Wall Colmonoy Corp., Detroit, Mich.
Thompson and Co., Oakmont, Pa.
Turco Products, Inc., Los Angeles, Calif.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

COMPRESSED AIR DEHUMIDIFIERS

See Dehumidifiers for Compressed Air

COMPRESSED AIR MOTORS

See Motors, Compressed Air Powered

COMPRESSION PIPE FITTINGS

See Fittings, Pipe, Compression

COMPRESSOR BASES

See Bases and Pads, Vibration Isolating

COMPRESSOR PARTS

See Parts, Refrigerating Compressor

COMPRESSOR SEALS

See Seals, Terminal, for Compressors

COMPRESSORS, AIR

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Blower Corp., Detroit, Mich.
Beach-Russ Co., New York, N. Y.
Binks Mfg. Co., Chicago, Ill.
Brunner Mfg. Co., Utica, N. Y.
Burgess-Thomas Co., Bloomfield, N. J.
Bury Compressor Co., Erie, Pa.
Carrier Corp., Syracuse, N. Y.
Champion Pneumatic Machinery Co., Princeton, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Clark Bros. Co., Div. of Dresser Operations, Inc., Olean, N. Y.
Cooper-Bessemer Corp., Mt. Vernon, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis.
Davey Compressor Co., Kent, O.
Dayton Electric Mfg. Co., Chicago, Ill.
DeVilbiss Co., The, Toledo, O.
Essick Mfg. Co., Los Angeles, Calif.
Fuller Co., Catasaqua, Pa.
Gardner-Denver Co., Quincy, Ill.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gray Co., Inc., Minneapolis, Minn.
Haskel Engineering & Supply Co., Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Joy Mfg. Co., Pittsburgh, Pa.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kraissl Co., Inc., The, Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Lima Electric Motor Co., The, Lima, O.
Lynch Corp., Anderson, Ind.
M & E Mfg. Co., Indianapolis, Ind.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Multiplex Mfg. Co., Berwick, Pa.
Nash Engineering Co., South Norwalk, Conn.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Roots-Connersville Blower Div., Connersville, Ind.
Schramm, Inc., West Chester, Pa.
Thomas Industries, Inc., Electric Sprayit Div., Sheboygan, Wis.
Union Steam Pump Co., Battle Creek, Mich.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Wayne Pump Co., Salisbury, Md.
Wilson Co., K. R., Arcade, N. Y.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

COMPRESSORS, REFRIGERATING, CENTRIFUGAL

American Blower Corp., Detroit, Mich.
Carrier Corp., Syracuse, N. Y.
Cooper-Bessemer Corp., Mt. Vernon, O.
Harv-O-Metic Co., Los Angeles, Calif.
Trane Co., The, LaCrosse, Wis.
Worthington Corp., Harrison, N. J.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

COMPRESSORS, REFRIGERATING, COMBINED WITH CONDENSER, WATER CHILLER, PIPING CONNECTIONS, AND CONTROLS

Acme Industries, Inc., Jackson, Mich.
Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Brown Products Corp., Forrest Hills, N. Y.
Brunner Mfg. Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Diceler Div. of General Machine & Mfg. Co., Berwick, Pa.
Doyle & Roth Mfg. Co., Brooklyn, N. Y.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Frick Co., Waynesboro, Pa.
Heat-X, Inc., Brewster, N. Y.
Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Mayer Refrigerating Eng., Inc., Lincoln Park, N. J.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Primor Products, Div. Borg-Warner Corp., Adrian, Mich.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Schnacke, Inc., Evansville, Ind.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United States Air Conditioning Corp., Philadelphia, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

COMPRESSORS, REFRIGERATING, RECIPROCATING

Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
Bendix-Westinghouse, Automotive Air Brake Co., Evansville, Ind.
Brunner Co., Gainesville, Ga.
Brunner Mfg. Co., Utica, N. Y. ("Freon" 12 & 22)
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O. (Radial)
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Copeland Refrigeration Corp., Sidney, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Diceler Div. of General Machine & Mfg. Co., Berwick, Pa.
Frick Co., Waynesboro, Pa. (Ammonia, "Freon")
Frigidaire Div., General Motors Corp., Dayton, O.
Howe Ice Machine Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Kelvinator Div., American Motors Corp., Detroit, Mich.
Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Multiplex Mfg. Co., Berwick, Pa.
Ready-Power Co., The, Detroit, Mich. (refrigeration unit driven by direct-connected internal combustion engine)
Reliance Refrigerating Machine Co., Chicago, Ill. ("Freon," methyl chloride, ammonia)
Schnacke, Inc., Evansville, Ind.
Stewart Ice Machine Co., Pomona, Calif.
Tecumseh Products Co., Tecumseh, Mich.
Thermo King Corp., Minneapolis, Minn.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis. ("Freon" ammonia)
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa. (Carbon dioxide, ammonia, "Freon")

COMPRESSORS, REFRIGERATING, STEAM JET

Croll-Reynolds Engrg. Co., Inc., New York, N. Y.
Graham Mfg. Co., Inc., New York, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

COMPRESSORS, STEAM BOOSTER

Bury Compressor Co., Erie, Pa.
Graham Mfg. Co., Inc., New York, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Worthington Corp., Harrison, N. J.

CONCRETE, INSULATING, FOR UNDERGROUND PIPING

Beltran Associates, Inc., Brooklyn, N. Y.
Dockstader, Inc., S. E., Washington, D. C.
Mearlcrete Div., Mearl Mfg. Corp., New York, N. Y.
Munn and Steele, Inc., South Boston, Mass.
Poe Co., C. W., The, Cleveland, O.
Zonolite Co., Chicago, Ill.

CONDENSATE DISPOSAL UNITS

See Pumps, Condensate, For Removing Condensation From Air Conditioning Units

CONDENSATE RETURN

See Pumps, Condensation Return; Systems, Condensate Return

CONDENSATION METERS

See Meters, Condensation

CONDENSATION PUMPS

See Pumps, Condensation

CONDENSER TUBES

See Tubes, Condenser

CONDENSERS, REFRIGERATING, AIR COOLED

American Standard, Air Conditioning Div., New York, N. Y. (2, 3 & 5 ton size)
Armstrong Furnace Co., Div. of Union Electric Corp., Columbus, O. (2 & 3 ton)
Baker Mfg. Co., Wichita Falls, Tex.
Blazer & Son, M., Passaic, N. J. (to 100 tons)
Bohn Aluminum & Brass Corp., Detroit, Mich. (2, 3, 5, & 7 ton)
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill. (1-10 tons)
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.

Deansteel Products Co., San Antonio, Tex. (3, 5, 7½ ton)
Domestic Mfg. Corp., Bellaire, Tex.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Fedders-Quigan Corp., Buffalo, N. Y.
General Air Conditioning Corp., Los Angeles, Calif. (2, 3 ton)
Halstead & Mitchell, Pittsburgh, Pa. (5 to 50 tons)
Heat-Exchangers, Inc., Chicago, Ill. (up to 10 ton)
Henry Furnace Co., The, Medina, O. (2, 3, 5 ton)
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga. (2-20 tons)
Lennox Industries, Inc., Marshalltown, Ia. (2, 3, 5 ton)
Marlo Coil Co., St. Louis, Mo. (1 to 20 tons)
McCord Corp., Detroit, Mich. (to 3 HP)
McQuay, Inc., Minneapolis, Minn. (2 to 15 HP)
Peerless of America, Inc., Chicago, Ill.
Perfection Industries Div., Hupp Corp., Cleveland, O. (2, 3, 5 ton)
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill. (1-30 tons)
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y. (up to 7½ hp)
Roberts-Gordon Appliance Corp., Buffalo, N. Y. (1¼-2-3-5 ton)
Rome-Turney Radiator Co., Rome, N. Y.
Round Oak Co., Inc., Dowagiac, Mich. (1½-5 HP)
Superior Radiator Corp., Minneapolis, Minn. (½ thru 30 HP)
Tenney Engineering, Inc., Union, N. J.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United Electric Co., Wichita Falls, Tex. (2, 3, & 5 ton)
United States Air Conditioning Corp., Philadelphia, Pa. (35.7½ HP)
Vilter Mfg. Co., The, Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whirlpool-Seeger Corp., Evansville, Ind.
Witt Co., A. H., Los Angeles, Calif. (2-25 ton)
Worthington Corp., Harrison, N. J.

CONDENSERS, REFRIGERATING, EVAPORATIVE

Acme Industries, Inc., Jackson, Mich.
Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Blaw Knox Co., Buflovak Equipment Div., Buffalo, N. Y.
Blazer & Son, M., Passaic, N. J.
Bohn Aluminum and Brass Corp., Betz Div., Danville, Ill.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y. ("Freon," ammonia)
Chrysler Airtemp, Div. of Chrylser Corp., Dayton, O.
Cobell Industries, Ft. Worth, Tex.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Kennard Corp., St. Louis, Mo.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Perfection Industries Div., Hupp Corp., Cleveland, O. (2, 3, 4, 5, 6 ton)
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Silco Products, Inc., Minneapolis, Minn.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Yorktowne Machine Co., York, Pa.

CONDENSERS, REFRIGERATING, SHELL AND COIL

Acme Industries, Inc., Jackson, Mich.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., The, Elyria, O.
Carrier Corp., Syracuse, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Davis Engineering Corp., Elizabeth, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
General Fittings Co., East Greenwich, R. I.
Halstead & Mitchell, Pittsburgh, Pa. (Double tube)
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Heil Process Equipment Corp., Cleveland, O.
Howe Ice Machine Co., Chicago, Ill. (Freon ammonia methyl chloride)
Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Nooter Corp., St. Louis, Mo.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Corp., W. Hartford, Conn.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

CONDENSERS, REFRIGERATING, SHELL AND TUBE

Acme Industries, Inc., Jackson, Mich.
Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Andale Co., Philadelphia, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Biggs Boiler Works Co., E. Akron, O.
Brown Fintube Co., The, Elyria, O.
Buxton Mfg. Co., Dover, N. J.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cooley Co., E. C., San Francisco, Calif.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Davis Engineering Corp., Elizabeth, N. J.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa.
Heat-X, Inc., Brewster, N. Y.
Howe Ice Machine Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nooter Corp., St. Louis, Mo.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Ready-Power Co., The, Detroit, Mich.
Reco Products Div., Recony Corp., New York.
Reliance Refrigerating Machine Co., Chicago, Ill.
Schnacke, Inc., Evansville, Ind.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Standard Refrigeration Co., Chicago, Ill.
Stewart Ice Machine Co., Pomona, Calif.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Co., W. Hartford, Conn.
Wittenmeier Machinery Co., Chicago, Ill.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

CONDENSERS, WATER DISTRIBUTORS FOR

See Distributors, Water, for Condensers

CONDENSING UNITS

See Compressors

CONDUCTORS AND PANELS, ELECTRICAL, FOR RADIANT HEATING

Adam Electric Co., Frank, St. Louis, Mo.
Berko Electric Mfg. Co., Queens Village, N. Y.
Continental Radiant Glass Heating Corp., New York, N. Y.
Corning Glass Works, Corning, N. Y.
Crystalheat Co., Van Nuys, Calif.
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Electriglas Corp., Bergenfield, N. J. (electric glass panels)
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Modernheat Cable Corp., Kingsport, Tenn.
Roberson Co., L. N., Seattle, Wash.
Sunwarm, Inc., Kingsport, Tenn.
ThermoRay Corp., Newark, N. J.
United States Rubber Co., New York, N. Y.
Wiegand Co., Edwin L., Pittsburgh, Pa.

CONDUIT, UNDERGROUND PIPING

American Metal Hose Div., American Brass Co., Waterbury, Conn.
Beltran Associates, Inc., Brooklyn, N. Y.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Dockstader, Inc., S. E., Washington, D. C.
Durant Insulated Pipe Co., Palo Alto, Calif.
Durant Insulated Pipe Co., Inc., Williamstown, N. J.
Flexaust Co., New York, N. Y.
Goodrich Industrial Products Co., B. F., Plastics Products, Marietta, O. (PVC)
Heat Transmission Conduit Co., Cleveland, O.
Johns-Manville, New York, N. Y.
Kaiser Co., E. B., Glenview, Ill.
Michigan Pipe Co., Gagetown, Mich.

Orangeburg Mfg. Co., Orangeburg, N. Y.
Porter & Co., Inc., H. W., Newark, N. J.
Ric-wiL, Inc., Barberton, O.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Stillwater Clay Products Co., The, Cleveland, O.
Water Tight Underground Conduit, Houston, Tex.

CONNECTIONS, DUCT, FLEXIBLE (ASBESTOS, CANVAS, ETC.)

American Metal Hose Div., American Brass Co., Waterbury, Conn. (Metal)
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Elgen Mfg. Corp., Long Island City, N. Y.
Felters Company, The, Boston, Mass.
Flexaust Co., New York, N. Y.
Flexible Tubing Corp., Guilford, Conn.
Flexonics Corp., Maywood, Ill.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
St. Clair Rubber Co., Detroit, Mich.
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O.
United States Rubber Co., New York, N. Y.
Ventfabrics Inc., Chicago, Ill.
Wagner Awning & Mfg. Co., Cleveland, O.
Wiremold Co., Hartford, Conn.

CONNECTORS, FILLING, HYDROSTATIC TEST

Gasoilair Equipment, New Haven, Conn.
Mechanical Products Corp., Chicago, Ill.
Roylyn, Inc., Glendale, Calif.
Scully Signal Co., Melrose, Mass.

CONNECTORS, FOR NON-METALLIC DUCT FABRICATION

Acme Steel Co., Chicago, Ill. (Strapping)
Lumm Co., A. H., Toledo, O.
United States Rubber Co., New York, N. Y.

CONTINUOUS HEATERS

See Heaters, Steam Jet, for Liquids

CONTROL, FOR INDIRECT WATER HEATERS

Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Bristol Co., The, Waterbury, Conn.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Defender Instrument & Regulator Co., Boody, Ill.
Detroit Controls Corp., Detroit, Mich.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Klipfel Valves, Inc., Hamilton, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.

CONTROL SYSTEMS, PRE-ASSEMBLED AS UNITS, FOR HEATING, COOLING AND VENTILATING

Factory Assemblies Using Other Manufacturers' Valves, Thermostats, Damper Motors, etc.

American Moistening Co., Providence, R. I.
Arens Controls, The, Evanston, Ill.
Automatic Devices Co., Inc., Western Springs, Ill.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Burke Engineering, Los Angeles, Calif.
Carvell Heat Equipment Co., Los Angeles, Calif.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Cleveland Fuel Equipment Co., Cleveland, O.
Defender Instrument & Regulator Co., Boody, Ill.
Devco Engineering, Inc., Caldwell, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
Heat-Timer Corp., New York, N. Y.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
International Business Machines Corp., New York, N. Y.
Master Control Co., The, Cuyahoga Falls, O.
Midwest Air Conditioning Co., Des Moines, Ia.
Midwest Automatic Control Co., Des Moines, Ia.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (package heat)
Ray Oil Burner Co., San Francisco, Calif.
Refrigeration Devices Co., Nutley, N. J.
Shallcross Controls, Inc., Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.
Webster & Co., Warren, Camden, N. J.
West Instrument Corp., Chicago, Ill.

CONTROLLERS AND STARTERS, MOTOR

ACEC Electric Corp., New York, N. Y.
Airgard Mfg. Co., Chicago, Ill.
Allen-Bradley Co., Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elec. Co., Hartford, Conn.
Burke Engineering, Los Angeles, Calif.
Clark Controller Co., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Ebert Electronics Corp., Queens Village, N. Y.
Electric Controller & Mfg. Co., Div. of Square D Co., Cleveland, O.
Electric Machinery Mfg. Co., Minneapolis, Minn.
Franklin Dales Co., Akron, O.
Furnas Electric Co., Batavia, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
Ideal Electric & Mfg. Co., Mansfield, O.
International Business Machine Corp., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Monitor Controller, Rockland, Mass.
Penn Controls, Inc., Goshen, Ind.
Potter & Brumfield Sales Co., Inc., Princeton, Ind.
Radex Corp., Chicago, Ill.
Reynolds Electric Co., River Grove, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Teleflex Inc., North Wales, Pa.
United Electric Controls Co., Watertown, Mass.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Zenith Electric Co., Chicago, Ill.

CONTROLS, AIR CONDITIONING

See Humidistats; Indicator-Controllers; Operators, Damper; Operators, Valve; Recorder-Controllers; Regulators; Relays; Switches; Thermostats; Valves, Diaphragm; Valves, Refrigeration; Valves, Solenoid

CONTROLS, DOOR, ELECTRIC EYE (FOR AIR CONDITIONED ROOMS)

Barber-Colman Co., Rockford, Ill.
Deltron, Inc., Philadelphia, Pa.
De-Tec-Tronic Corp., Chicago, Ill.
Ess Instrument Co., Bergenfield, N. J.
Stanley Works, The, New Britain, Conn.
Sterns-Flinn Corp., New York, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Worner Electronic Devices, Rankin, Ill.

CONTROLS, DRAFT, BAROMETRIC

Ace Instrument Co., Inc., Brooklyn, N. Y.
Boston Machine Works Co., Lynn, Mass.
Bristol Co., The, Waterbury, Conn.
Cole-Sewell Engineering Co., St. Paul, Minn.
Combustion Equipment Co., Moline, Ill.
Corley Co., Inc., The, New York, N. Y.
Defender Instrument & Regulator Co., Boody, Ill.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Ess Instrument Co., Bergenfield, N. J.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Fuel Reduction Corp., Chicago, Ill.
Fuelguard Co., Dallas, Tex.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Hotstream Heater Co., Cleveland, O.
Krueger Sentry Gauge Co., Green Bay, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Salina Metal Products Co., Salina, Kan.
Simplex Mfg. Co., Fond du Lac, Wis.
Steinen Mfg. Co., Wm., Newark, N. J.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Windmaster Corp., Columbus, O.

CONTROLS, FIRE PROTECTION SPRINKLER SYSTEMS

Allen Mfg. Co., W. D., Chicago, Ill.
American District Telegraph Co., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Clark Controller Co., Cleveland, O.
Fenwal Inc., Ashland, Mass.
Grinnell Co., Inc., Providence, R. I.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Synchro-Start Products, Inc., Skokie, Ill.

CONTROLS, FLAME FAILURE

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
American District Telegraph Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., The, Waterbury, Conn.
Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.
Defender Instrument & Regulator Co., Boody, Ill.
De-Tec-Tronic Corp., Chicago, Ill.
Drying Systems, Inc., Chicago, Ill.
Ess Instrument Co., Bergenfield, N. J.
Fuelguard Co., Dallas, Tex.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Haney Gas Burner & Engrs., Inc., Monrovia, Calif.
Mercoid Corp., The, Chicago, Ill.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Scully Signal Co., Melrose, Mass.
Stout & Sons, David, St. Louis, Mo.
Teleflex Inc., North Wales, Pa.
Webster Engineering Co., Tulsa, Okla.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
White-Rodgers Co., St. Louis, Mo.

CONTROLS, HEATING

See Alarms; Humidistats; Indicator-Controllers; Operators, Damper; Operators, Valve; Recorder-Controllers; Regulators; Relays; Switches; Systems, Combusion Control; Systems, Heating; Thermostats; Valves, Balancing, for Forced Hot Water Heating Systems; Valves, Diaphragm; Valves, Flow Control; Valves, Mixing; Valves, Pressure Reducing and Regulating; Valves, Radiator; Valves, Solenoid

CONTROLS, PUSH-PULL

See Shafts, Flexible, Push-Pull, for Control

CONTROLS, REFRIGERATION

See Humidistats; Operators, Valve; Relays; Switches; Thermostats; Valves, Refrigeration; Valves, Solenoid

CONVECTORS

See Radiation, Convection Type

CONVERTORS, STEAM

Alstrom Corp., New York, N. Y.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American District Steam Div., ADSCO Industries Inc., Buffalo, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Buxton Mfg. Co., Dover, N. J.
Cooley Co., E. C., San Francisco, Calif.
Davis Engineering Corp., Elizabeth, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
General Fittings Co., East Greenwich, R. I.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Novelty Steam Boiler Works, Inc., Baltimore, Md.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Richmond Engineering Co., Richmond, Va.
Taco Heaters, Inc., Cranston, R. I.
Yula Water Heaters, Inc., Bronx, N. Y.

CONVEYORS, COAL AND ASH

Ajax Flexible Coupling Co., Westfield, N. Y.
American Coal Burner and Wood Stoker Corp., Chicago, Ill.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I. (continuous weighing)
Canton Stoker Corp., Canton, O.
Chain Belt Co., Milwaukee, Wis.
Cleveland Crane & Eng. Co., Wickliffe, O.
CraneVeyor Corp., Los Angeles, Calif.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Hager Bros., Rockford, Ill.
Hewitt-Robins, Inc., Stamford, Conn.
Jeffrey Mfg. Co., Columbus, O.
Johnston & Jennings Co., Cleveland, O.
Joy Mfg. Co., Pittsburgh, Pa.
Kol-Master Corp., Oregon, Ill.
Link-Belt Co., Chicago, Ill.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Spurgeon Co., Van Dyke, Mich.
Standard Transmission Equipment Co., Pasadena, Calif.
Whitty Co., Inc., Boston, Mass.

COOLERS, CRANE CAB

Dravo Corp., Machinery Div., Pittsburgh, Pa.
Lintern Corp., Painesville, O.
Trane Co., The, LaCrosse, Wis.

COOLERS, EVAPORATIVE

See Units, Air Conditioning, Summer, Evaporative Cooling Type

COOLERS, OIL

Acme Industries, Inc., Jackson, Mich.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Cooling Tower Co., Kansas City, Mo.
American District Steam Div., ADSCO Industries Inc., Buffalo, N. Y.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Andale Co., Philadelphia, Pa.
Armstrong Co., Richard M., Westchester, Pa.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., The, Elyria, O.
Buxton Mfg. Co., Dover, N. J.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cooley Co., E. C., San Francisco, Calif.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Ellis & Watts Products, Inc., Cincinnati, O. (solvent)
Fedders-Quigan Corp., Buffalo, N. Y.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Air Conditioning & Refrigeration Cooling Tower Div., Whittier, Calif.
G & O Mfg. Co., New Haven, Conn.
Gilbert Brass Foundry Co., St. Louis, Mo.
Graham Mfg. Co., Inc., New York, N. Y.
Griffin & Co., Louisville, Ky.
Griscom-Russell Co., The, Massillon, O.
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Kellogg Co., The, M. W., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Marlo Coil Co., St. Louis, Mo.
Modine Mfg. Co., Racine, Wis.
National Pipe Bending Co., New Haven, Conn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Struthers Wells Corp., Titusville, Pa.
Super Radiator Corp., Minneapolis, Minn.
Taco Heaters, Inc., Cranston, R. I.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Whitlock Mfg. Co., W. Hartford, Conn.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

COOLERS, UNIT (FLOOR TYPE)

Not air conditioning units, but floor mounted unit with coil and centrifugal fans without filters, for connection to remote compressor or cold water supply. For air conditioning units see Units, Air Conditioning

Auburn Burner Co., Auburn, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dole Refrigerating Co., Chicago, Ill.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Frick Co., Waynesboro, Pa.
Governair Corp., Oklahoma City, Okla.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Niagara Blower Co., New York, N. Y.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Yorktowne Machine Co., York, Pa.
Young Radiator Co., Racine, Wis.

COOLERS, UNIT (SUSPENDED TYPE)

Not air conditioning units, but suspended unit with coil and propeller fan, without filters, for connection to remote compressor or cold water supply. For air conditioning units, see Units, Air Conditioning

American Coils Co., Newark, N. J.
American Cooling Tower Co., Kansas City, Mo.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Dole Refrigerating Co., Chicago, Ill.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Governair Corp., Oklahoma City, Okla.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Merchant & Evans Co., Philadelphia, Pa.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Vilter Mfg. Co., Milwaukee, Wis.
Wilson Engineering Corp., Chicago, Ill.
Wing Mfg. Co., L. J., Linden, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

COOLING COILS

See Surface Finned Cooling

COOLING SURFACE

See Surface Finned Cooling

COOLING TOWERS

See Towers, Cooling

COOLING UNITS

See Units, Air Conditioning; Coolers, Unit

COPPER PIPE

See Pipe, Brass and Copper

COPPER SHEETS

See Sheets, Copper

COPPER TUBE FITTINGS

See Fittings, Copper Tube

COPPER TUBE FITTINGS, FLARED

See Fittings, Copper Tube, Flared

COPPER TUBING

See Tubing, Brass and Copper

CORROSION PREVENTIVES

See Devices, Electrolytic, for Preventing Corrosion; Treatment, Steam System, to Inhibit Corrosion; and Treatment, Water, to Inhibit Corrosion

COUNTERS, DUST

Bausch & Lomb Optical Co., Rochester, N. Y.
Hill & Co., E. Vernon., Lake Geneva, Wis.
Mine Safety Appliances Co., Pittsburgh, Pa.
Willson Products, Inc., Reading, Pa.

COUPLINGS, FLEXIBLE, POWER TRANSMISSION

Ajax Flexible Coupling Co., Westfield, N. Y.
American Flexible Coupling Div., Zurn Industries, Inc., Erie, Pa.
Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich. (Universal joints)
Boston Gear Wks., Quincy, Mass.
Brooks Equipment Corp., Hoboken, N. J.
Browning Mfg. Co., Maysville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill.
Chain Belt Co., Milwaukee, Wis.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clifford Mfg. Co., Div. of Standard-Thompson

Corp., Waltham, Mass.
Climax Metal Products Co., Cleveland, O.
Congress Drives Div., Tann Corp., Detroit, Mich.
De Laval Steam Turbine Co., Trenton, N. J.
Dings Magnetic Separator Co., Milwaukee, Wis.
Dodge Mfg. Corp., Mishawaka, Ind.
Elliott Co., Jeannette, Pa.
Falk Corp., Milwaukee, Wis.
Guardian Products Corp., Michigan City, Ind.
Jeffrey Mfg. Co., Columbus, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
LimiTorque Corp., Philadelphia, Pa.
Link Belt Co., Chicago, Ill.
Lord Mfg. Co., Erie, Pa.
Lovejoy Flexible Coupling Co., Chicago, Ill
Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O. (automatic centrifugal clutch)
Morse Chain Co., Ithaca, N. Y.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Piezo Mfg. Corp., Staten Island, N. Y.
Poole Foundry & Machine Co., Baltimore, Md.
Ramsey Chain Co., Inc., Albany, N. Y.
Royersford Foundry & Machine Co., Inc., Royersford, Pa.
Shallcross Co., Philadelphia, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Smith & Serrell, Inc., Newark, N. J.
Stow Mfg. Co., Binghamton, N. Y.
Thomas Flexible Coupling, Warren, Pa.
Waldron Corp., John, New Brunswick, N. J (gear type)
Westinghouse Electric Corp., Pittsburgh, Pa
Whitney Chain Co., Hartford, Conn.
Wood's Sons Co., T. B., Chambersburg, Pa

COUPLINGS, PIPE

Acheson Mfg. Co., Rankin, Pa.
Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Aeroquip, Inc., Van Wert, O.
Baker & Co., R. H., Huntington Park, Calif.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Camco Products Inc., North Haven, Conn.
Capitol Mfg. & Supply Co., Columbus, O.
Chase Brass & Copper Co., Waterbury, Conn.
Clow & Sons, Inc., James B., Chicago, Ill.
Continental-Diamond Div. of The Budd Co. Inc., Newark, Del.
Cooper-Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Fischer & Porter Co., Hatboro, Pa. (glass to glass; glass to metal)
Flagg & Co., Inc., Stanley G., Philadelphia.
Flodar Corp., Cleveland, O.
Frick Co., Waynesboro, Pa.
Frontier Bronze Corp., Niagara Falls, N. Y.
Gilbert Brass Foundry Co., St. Louis, Mo.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Plastics Products, Marietta, O. (PVC)
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Hansen Mfg. Co., Cleveland, O.
Harrisburg Steel Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hewitt-Robins, Inc., Stamford, Conn.
Illinois Malleable Iron Co., Chicago, Ill.
Johns-Manville, New York, N. Y.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
King Union Co., Inc., Hillsgrove, R. I.
Ladish Co., Cudahy, Wis.
Malleable Iron Fittings Co., Branford, Conn.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Morris Coupling & Clamp Co., Kittanning, Pa
Mueller Brass Co., Port Huron, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
New York Brass Foundry, New York, N. Y. (brass)
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pipe Line Development Co., Cleveland, O.
Pipe Plugs, Inc., Wellington, O.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Pittsburgh Pipe & Coupling Co., Allison Park, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Rhode Island Fittings Co., Providence, R. I.
Roylyn, Inc., Glendale, Calif.
Span Brass Mfg. Co., Otsego, Mich.
Spang-Chalfant, Div. of the National Supply Co., Pittsburgh, Pa.
Star Stainless Screw Co., Paterson, N. J.
Steel Improvement & Forge Co., The, Cleveland, O.
Stockham Valves & Fittings, Birmingham, Ala.
Stokes Molded Products, Div. of The Electric Storage Battery Co., Trenton, N. J. (unplasticized polyvinyl chloride)
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky. (welding couplings)
Tube Turns Plastics, Inc., Louisville, Ky. (PVC)
U. S. Plug & Fitting Co., Wellington, O.
Union Malleable Mfg. Co., Ashland, O.
Union Metal Works Co., Inc., Chelsea, Mass.
United States Gasket Co., Camden, N. J.
United States Stoneware Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.
Victaulic Co. of America, Elizabeth, N. J.
Vogt Machine Co., Henry, Louisville, Ky.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J. (forged steel)
Wachs Co., E. H., The, Chicago, Ill.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Wheatland Tube Co., Philadelphia, Pa.
Wheeling Machine Products Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Youngstown Sheet & Tube Co., Youngstown, O.

COUPLINGS, PIPE, DETACHABLE

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Aeroquip, Inc., Van Wert, O.
American Flow Control Corp., Houston, Tex.
Anchor Coupling Co., Libertyville, Ill. (hose)
Baker & Co., R. H., Huntington Park, Calif.
Dahl, G. W., Bristol, R. I.
Goodrich Industrial Products Co., B. F., Plastics Products, Marietta, O. (PVC)
Hunt & Son, Inc., C. B., Salem, O.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Morris Coupling & Clamp Co., Kittanning, Pa.
Nelson Foundry Co., Morton Grove, Ill.
OPW Corp., Cincinnati, O.
Quick Joint Div., Automatic Bending Co., Harvey, Ill.
Roylyn, Inc., Glendale, Calif.
Smith Bros. Co., Oak Park, Ill.
Snap-Tite, Inc., Union City, Pa.
Vanton Pump & Equipment Corp., Hillside, N. J.
Victaulic Co. of America, Elizabeth, N. J.
Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.

COVERS, PROTECTIVE, FOR WINDOW AIR CONDITIONERS

Blossom Mfg. Co., Inc., New York, N. Y.
Budlew Products Co., Chicago, Ill.
Canvas Products Co., St. Louis, Mo.
Ero Mfg. Co., Chicago, Ill.
International Covers for Air Conditioners Corp., New York, N. Y.
Tulsa Canvas Products Co., Inc., Tulsa, Okla.
Wagner Awning & Mfg. Co., Cleveland, O.

CRANE CAB COOLERS

See Coolers, Crane Cab

CUT-OFFS, LOW WATER, HEATING BOILER

Eclipse Fuel Engineering Co., Rockford, Ill.
Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Instruments, Inc., Tulsa, Okla.
Johnson Corp., The, Three Rivers, Mich.
Magnetrol Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Morse-Smith-Morse Co., The, Watertown, Mass.
Newark Controls Co., Bloomfield, N. J.
Reliance Gauge Column Co., Cleveland, O.
Schaub Engineering Co., Fred H., Chicago.
Techniflex Corp., Port Jervis, N. Y.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

CUTTERS, FLAME FOR PIPING

Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas Co., Chicago, Ill.
Springload Mfg. Corp., Seattle, Wash.
Vernon Tool Co., Ltd., Alhambra, Calif.

CUTTERS, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Baker & Co., R. H., Huntington Park, Calif.
Barnes Tool Co., The, New Haven, Conn.
Beaver Pipe Tools, Inc., Warren, O. (knife and wheel)
Capewell Mfg. Co., Hartford, Conn.
Clow & Sons, Inc., James B., Chicago, Ill.
Collins Machinery Corp., Los Angeles, Calif.
Continental Machine Co., Chicago, Ill.
Crown Die & Tool Corp., Chicago, Ill. (1 wheel and 3 wheel)
Erie Tool Works, Erie, Pa.
Hollands Mfg. Co., Erie, Pa.
Kalamazoo Tank & Silo Co., Machine Tool Div., Kalamazoo, Mich. (metal cutting band saw)
Landis Machine Co., Inc., Waynesboro, Pa. (roller)
M-M-A, Inc., Lancaster, Pa.
Nye Tool Co., Chicago, Ill.
Obear & Son, W. F., Inglewood, Calif. (abrasive)
Oster Mfg. Co., Cleveland, O. (portable power)
Pilot Mfg. Co., Torrance, Calif.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Saunders Mfg. Co., Yonkers, N. Y.
Springload Mfg. Corp., Seattle, Wash.
Talon Tools, Inc., North Arlington, N. J. (chain type)
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass. (hand)
Wachs Co., E. H., The, Chicago, Ill. (pipe saw)

CUTTERS, TUBING

Armstrong Bros. Tool Co., Chicago, Ill.
Bonney Forge & Tool Works, Allentown, Pa.
Capewell Mfg. Co., Hartford, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Collins Machinery Corp., Los Angeles, Calif.
Continental Machine Co., Chicago, Ill.
Couplings Co., Chicago, Ill.
Duro Metal Products Co., Chicago, Ill.
Erie Tool Works, Erie, Pa.
Fenway Machine Co., Philadelphia, Pa. (also sheet metal)
Imperial Brass Mfg. Co., Chicago, Ill.
Landis Machine Co., Inc., Waynesboro, Pa.
Mueller Brass Co., Port Huron, Mich.
Nye Tool Co., Chicago, Ill.
Obear & Son, W. F., Inglewood, Calif.
Parker Appliance Co., The, Cleveland, O.
Penn Brass & Copper Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Springload Mfg. Corp., Seattle, Wash.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass. (hand)
Wallace Supplies Mfg. Co., Chicago, Ill.
Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.
Wilson Manufacturing Co., Memphis, Tenn.

DAMPER OPERATORS
See Operators, Damper

DAMPER REGULATORS
See Regulators, Damper Sets

DAMPERS, DIFFUSER
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Gallaher Co., The, Omaha, Neb.
Hart & Cooley Mfg. Co., Holland, Mich.
Lima Register Co., Lima, O.
Rittling Corp., The, Buffalo, N. Y.
Round Oak Co., Inc., Dowagiac, Mich.
United States Register Co., Battle Creek, Mich.
Young Regulator Co., Cleveland, O.

DAMPERS, DUCT, MANUALLY OPERATED
Acme Mfg. Co., Philadelphia, Pa.
Adams Co., The, Dubuque, Ia.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Air Conditioning Engineering Co., Cambridge, Mass.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Ammerman Co., Inc., Minneapolis, Minn.
Anemostat Corp. of America, New York.
Controlair Mfg. Co., Los Angeles, Calif.
Corbman Bros., Inc., Philadelphia, Pa.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Elgo Shutter & Mfg. Co., Detroit, Mich.
Excelsior Steel Furnace Co., Chicago, Ill.
General Register Corp., Cedar Grove, N. J.
Hart & Cooley Mfg. Co., Holland, Mich.
Imperial Damper Co., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Lennox Industries, Inc., Marshalltown, Ia.
Marsto Machine Co., West Quincy, Mass.
Minneapolis Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Powers Regulator Co., Skokie, Ill.
Rittling Corp., The, Buffalo, N. Y.
Round Oak Co., Inc., Dowagiac, Mich.
Seelye Craftsman, Minneapolis, Minn.
Sioux Steel Co., Sioux Falls, S. D.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United Sheet Metal Co., Inc., Columbus, O.
United States Register Co., Battle Creek, Mich.
Waterloo Register Co., Inc., Waterloo, Ia.
Williamson Co., Cincinnati, O.
Young Regulator Co., Cleveland, O.

DAMPERS, DUCT, REMOTE CONTROLLED
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Anemostat Corp. of America, New York.
Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Buensod-Stacey, Inc., New York, N. Y.
Combustion Equipment Co., Moline, Ill.
Controlair Mfg. Co., Los Angeles, Calif.
Johnson Service Co., Milwaukee, Wis.
Lennox Industries Inc., The, Marshalltown, Ia.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Rittling Corp., The, Buffalo, N. Y.
Seelye Craftsman, Minneapolis, Minn.
Shallcross Controls, Inc., Milwaukee, Wis.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Vapor Heating Corp., Chicago, Ill.
Young Regulator Co., Cleveland, O.

DAMPERS, FIRE, FUSIBLE LINK
Air-Factors, Inc., Monrovia, Calif.
Air-Path Products Co., Baltimore, Md.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Arex Co., Chicago, Ill.
Atmos Corp., Chicago, Ill.
Controlair Mfg. Co., Los Angeles, Calif.
Haertel Co., Walter, Minneapolis, Minn.
Imperial Damper Co., New York, N. Y.
Seelye Craftsman, Minneapolis, Minn.
United Sheet Metal Co., Inc., Columbus, O.
United States Register Co., Battle Creek, Mich.
Young Regulator Co., Cleveland, O.

DAMPERS, PULSATION, FOR PIPING SYSTEMS
Campbell Co., J. A., Long Beach, Calif.
Fluor Products Co., A Div. of the Fluor Corp. Ltd., Air Conditioning & Refrigeration Cooling Tower Div., Whittier, Calif.
Greer Hydraulics, Inc., Jamaica, N. Y.
Industrial Acoustics Co., Inc., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
United States Register Co., Battle Creek, Mich.

DEAERATORS
Acker Corp., Meridian, Miss.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Water Softener Co., Philadelphia.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Blaw Knox Co., Buflovak Equipment Div., Buffalo, N. Y.
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Elgin Softener Corp., Elgin, Ill.
Elliott Co., Jeannette, Pa.
Finnigan & Co., Inc., J.J., Atlanta, Ga.
General Filter Co., Ames, Ia.
Graham Mfg. Co., Inc., New York, N. Y.
Graver Water Conditioning Co., New York.
Hoppes Mfg. Co., Inc., Springfield, O.
Permutit Co., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis. Ind.
Whitlock Mfg. Co., W. Hartford, Conn.
Worthington Corp., Harrison, N. J.

DEEP WELL PUMPS
See Pumps, Deep Well

DEHUMIDIFIERS, ABSORPTION AND ADSORPTION
Abbeon Supply Co., Jamaica, N. Y.
Air Conditioning Engineering Co., Cambridge, Mass.
Barnebey-Cheney Co., Columbus, O.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.
Cargocaire Engineering Corp., New York.
Desomatic Products, Inc., Falls Church, Va.
Dow Chemical Co., The, Midland, Mich.
Dryomatic Corp., Alexandria, Va.
Floridin Co., Tallahassee, Fla.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Kaufman Co., H. J., Detroit, Mich.
Niagara Blower Co., New York, N. Y.
Pittsburgh Lectrodryer Co., Pittsburgh, Pa.
Socony-Mobil Oil Co., Inc., New York, N. Y.
Surface Combustion Corp., Toledo, O.
Tamms Industries, Inc., Chicago, Ill.

DEHUMIDIFIERS FOR COMPRESSED AIR
Adams Co., Inc., R. P., Buffalo, N. Y.
Centrifix Corp., Cleveland, O.
Desomatic Products, Inc., Falls Church, Va.
Dryomatic Corp., Alexandria, Va.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Perfecting Service Co., Charlotte, N. C.
Pittsburgh Lectrodryer Co., Pittsburgh, Pa.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Selas Corp. of America, Dresher, Pa.

DEHUMIDIFIERS, ELECTRIC PLUG-IN, FOR SMALL SPACES
Abbeon Supply Co., Jamaica, N. Y.
Blissfield Mfg. Co., Blissfield, Mich.
Cargocaire Engineering Corp., New York, N. Y.
Desomatic Products, Inc., Falls Church, Va.
Dryomatic Corp., Alexandria, Va.
Ebco Mfg. Co., Columbus, O.
Fedders-Quigan Corp., Buffalo, N. Y.
Fresh'nd-Aire Company, Div. of Cory Corp., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati.
Haertel Co., Walter, Minneapolis, Minn.
Hotpoint Co., Chicago, Ill.
McGraw Electric Co., Lonergan Mfg. Div., Albion, Mich.
Mitchell Mfg. Co., Chicago, Ill.
Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Taylor Co., Halsey W., Warren, O.
Walton Laboratories, Inc., Irvington, N. J.
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass.
Whirlpool-Seeger Corp., Evansville, Ind.

DEHUMIDIFIERS, SPRAY
See Washers, Air

DEHUMIDIFIERS, SPRAYED COIL
Air & Refrigeration Corp., New York, N. Y.
American Blower Corp., Detroit, Mich.
Blazer & Son, M., Passaic, N. J.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Kennard Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

DEHUMIDIFYING UNITS
See Units, Air Conditioning; Dehumidifiers

DEHYDRANT AND ACID NEUTRALIZER, FOR REFRIGERATING SYSTEMS
Allin Mfg. Co., Chicago, Ill.
Berna Corp., Garwood, N. J.
Davison Chemical Co., Div. of W. R. Grace & Co., Baltimore, Md.
McIntire Co., The, Livingston, N. J.
Mueller Brass Co., Port Huron, Mich.
Remco, Inc., Zelienople, Pa.
Stewart Industries, Inc., Clifton, N. J.

DEHYDRATORS, REFRIGERANT
A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Aluminum Co. of America, Pittsburgh, Pa.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Berna Corp., Garwood, N. J.
Eagle Chemical Co., Inc., Chicago, Ill.
Fine Products Co., Berwyn, Ill.
Floridin Co., Tallahassee, Fla.
Frigidaire Div., General Motors Corp., Dayton, O.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Madden Brass Products Co., Aurora, Ill.
McIntire Co., The, Livingston, N. J.
Mueller Brass Co., Port Huron, Mich.
Remco, Inc., Zelienople, Pa.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Wabash Corp., Chicago, Ill.

DENSIFIERS, CONCRETE, FOR INCREASING THERMAL CONDUCTIVITY

Products Planning Co., Pittsburgh, Pa.

DESTROYERS, SOOT, CHEMICAL

Allen Co., Robert G., Mechanicsville, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Coughlan Co., G. N., West Orange, N. J.
General Filters, Inc., Novi, Mich.
Hercules Chemical Co., Inc., New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., Cleveland, O. (flue and chimney cleaners)
Nutmeg Chemical Co., New Haven, Conn.
Perolin Co., Inc., New York, N. Y.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Tamms Industries, Inc., Chicago, Ill.
Warren Refining & Chemical Co., The, Cleveland, O.

DESUPERHEATERS, STEAM

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Brown Fintube Co., The, Elyria, O.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Foster Wheeler Corp., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Springfield Boiler Co., Springfield, Ill.
Whitlock Mfg. Co., W. Hartford, Conn.

DETECTORS, LEAK, FUEL OIL

American Gas & Chemicals, Inc., Leak-Tec Div., New York, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Techniflex Corp., Port Jervis, N. Y.
Yula Water Heaters, Inc., Bronx, N. Y.

DETECTORS, LEAK, PIPING

American Gas & Chemicals, Inc., Leak-Tec Div., New York, N. Y. (gas, hydrogen, nitrogen, oxygen, ammonia, chloride)
Met-L-Chek Co., Los Angeles, Calif.
Smith Chemical Co., E. W., La Puente, Calif.
Universal Controls Corp., Dallas, Tex.
Zaco Labs., Div. of Zip Abrasive Co., Cleveland, O.

DETECTORS, LEAK, REFRIGERANT

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Allin Mfg. Co., Chicago, Ill.
American Gas & Chemicals, Inc., Leak-Tec Div., New York, N. Y.
Bernz Co., Otto, Rochester, N. Y.
Chicago Forging and Mfg. Co., Chicago, Ill.
Devco Engineering, Inc., Caldwell, N. J.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Goss Gas, Inc., Pittsburgh, Pa.
Insto-Gas Corp., Detroit, Mich.
Justrite Mfg. Co., Chicago, Ill.
Lenk Mfg. Co., Boston, Mass.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas Co., Chicago, Ill.
Stewart Industries, Inc., Clifton, N. J.
Turner Brass Wks., Sycamore, Ill.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.
Weldit, Inc., Detroit, Mich.

DETECTORS, LEAK, UNDERGROUND PIPING

Fisher Research Laboratory, Inc., Palo Alto, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Globe Phone Mfg. Co., Reading, Mass.
Johnson-Williams Inc., Palo Alto, Calif.
Mine Safety Appliance Co., Pittsburgh, Pa.
Wilkinson Products Co., Pasadena, Calif.

DEVICES, ELECTROLYTIC, FOR PREVENTING CORROSION

Brown-Electro Co., Oklahoma City, Okla.
Cleveland Heater Co., Cleveland, O. (anodic rods)
Division Lead Co., Summit, Ill.
Electro Rust-Proofing Corp., Belleville, N. J.
Engelhard, Inc., Charles, East Newark, N. J.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Harco Corp., Bedford, O.
Magnode Products, Inc., Trenton, O.
Marlo Coil Co., St. Louis, Mo.
May Company, Galesburg, Ill.
Metal & Thermit Corp., Rahway, N. J.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
Rotometals, San Francisco, Calif.
Wallace & Tiernan Inc., Belleville, N. J.

DEW POINT INDICATORS

See Indicators, Dew Point

DIAPHRAGM VALVES

See Valves, Diaphragm

DIESEL ENGINES

See Engines, Diesel, for Fan, Pump and Compressor Drives

DIFFUSERS, AIR, BASEBOARD

A. & A. Register Co., Cleveland, O.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Auer Register Co., Cleveland, O.
Brandes Co., Madison, Wis.
Coleman Co., Inc., The, Wichita, Ks.
General Automatic Products Corp., Baltimore, Md.
General Register Corp., Cedar Grove, N. J.
Gerwin Industries, Inc., Michigan City, Ind.
Hart & Cooley Mfg. Co., Holland, Mich.
Heating Assurance, Inc., Spokane, Wash.
Independent Register Co., Cleveland, O.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lima Register Co., Lima, O.
Patco Mfg. Co., Philadelphia, Pa.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Thermo-Base Div., Gerwin Industries, Michigan City, Ind.
Titus Mfg. Corp., Waterloo, Ia.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., Tuckahoe, N. Y.
Viking Mfg. Corp., Cleveland, O.
Vulcan Radiator Co., Hartford, Conn.

DIFFUSERS, AIR, CEILING

See also Grilles; Panels, Perforated, for Air Diffusions; Registers

A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air Distribution Products Co., Los Angeles, Calif.
Air-Factors, Inc., Monrovia, Calif.
Air Fan Engineering Co., Los Angeles, Calif.
Aladdin Heating Corp., San Leandro, Calif.
Anemostat Corp. of America, New York, N. Y.
Ashburn Supply Co., Culver City, Calif.
Auer Register Co., Cleveland, O.
Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.
Barber-Colman Co., Rockford, Ill.
Carnes Corp., Verona, Wis.
Coleman Co., Inc., The, Wichita, Ks.
Connor Engineering Corp., Danbury, Conn.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
Gallaher Co., The, Omaha, Neb.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Krueger Air Conditioning Co., Tucson, Ariz.
Lima Register Co., The, Lima, O.
Louvra Mfg. & Sales Co., Union, N. J.
Midco Register Corp., St. Paul, Minn.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Thermotank, Inc., Products Div., Detroit, Mich.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., Tuckahoe, N. Y.
Viking Mfg. Corp., Cleveland, O.
Young Regulator Co., Cleveland, O.

DIFFUSERS, AIR, CEILING WITH COMBINED LIGHTING FIXTURE

Air Devices, Inc., New York, N. Y.
Air-Factors, Inc., Monrovia, Calif.
Anemostat Corp. of America, New York.
Barber-Colman Co., Rockford, Ill.
Carnes Co., Verona, Wis.
Connor Engineering Corp., Danbury, Conn.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Thermotank, Inc., Products Div., Detroit, Mich.
Titus Mfg. Corp., Waterloo, Iowa.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Universal Diffuser Corp., Tuckahoe, N. Y.
Wakefield Co., The, Vermilion, O.

DIFFUSERS, AIR, FLOOR

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Auer Register Co., Cleveland, O.
Coleman Co., Inc., The, Wichita, Ks.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Lima Register Co., Lima, O.
Ritter Pattern & Casting Co., Inc., New York.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
United States Register Co., Battle Creek, Mich.

DIFFUSERS, AIR, HIGH PRESSURE

Air Devices, Inc., New York, N. Y.
American Warming & Ventilating Co., Toledo, O.
Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Coleman Co., Inc., The, Wichita, Ks.
Connor Engineering Corp., Danbury, Conn.
Independent Register Co., Cleveland, O.
Lima Register Co., Lima, O.
Super Steel Products Co., Milwaukee, Wis.
Thermotank, Inc., Products Div., Detroit, Mich.
Titus Mfg. Corp., Waterloo, Iowa
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Universal Diffuser Corp., Tuckahoe, N. Y.

DIFFUSERS, AIR, WALL

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air Distribution Products Co., Los Angeles.
Air-Factors, Inc., Monrovia, Calif.
American Warming & Ventilating Co., Toledo, O.
Anemostat Corp. of America, New York, N. Y.
Auer Register Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Coleman Co., Inc., The, Wichita, Ks.
Demuth & Sons, Inc., Charles, Mineola, L. I., N. Y.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Lima Register Co., Lima, O.
Louvra Mfg. & Sales Co., Union, N. J.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Titus Mfg. Corp., Waterloo, Ia.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., Tuckahoe, N. Y.

DIFFUSION, AIR

See Panels, Perforated, for Air Diffusion

DISTRIBUTORS, REFRIGERANT, FOR COOLING COILS

General Controls Co., Glendale, Calif.
Sporlan Valve Co., St. Louis, Mo.

DISTRIBUTORS, WATER, FOR CONDENSERS

Hubbell Corp., Mundelein, Ill.

DOOR CONTROLS

See Controls, Door, Electric Eye

DOORS AND PANELS, ACCESS

Adams Co., The, Dubuque, Ia.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Metal Works, Inc., New Orleans, La.
Auer Register Co., Cleveland, O.
Biersach & Niedermeyer Co., Milwaukee, Wis.
Camloc Fastener Corp., Paramus, N. J. (Fasteners for access panels and sheet metals)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Falstrom Co., Passaic, N. J.
Haertel Co., Walter, Minneapolis, Minn.
Inland Steel Products Co., Milwaukee, Wis.
International Steel Co., Evansville, Ind.
Kirk & Blum Mfg. Co., Cincinnati, O.
Knapp Bros. Mfg. Co., Cincinnati, O.
Lumm Co., A. H., Toledo, O.
Technical Ply-Wood Sales, Chicago, Ill.
Ventfabrics, Inc., Chicago, Ill.
Walsh Co., L. M., The, Boston, Mass.
Western Wire & Iron Works, Inc., Chicago, Ill. (Metal)
Willis Steel Corp., Galesburg, Ill.
Zurn Mfg. Div., J. A., Zurn Industries, Inc., Erie, Pa.

DOORWAYS, AIR CURTAIN, FOR LARGE ENTRANCES

(Including nozzles, fans, ducts, heating and cooling coils, etc.)

American Air Curtain Corp., St. Louis, Mo.

DOUBLE DUCT MIXING UNITS, SOUND AND VOLUME CONTROL, FOR AIR CONDITIONING SYSTEMS

See Units, Mixing, Sound and Volume Control, for Double Duct High Velocity Air Conditioning Systems

DRAFT CONTROL

See Controls, Draft, Barometric; Regulators, Draft, Combustion

DRAFT GAGES

See Gages, Indicating, Draft

DRAFT RECORDERS

See Recorders, Draft

DRAFT REGULATORS

See Controls, Draft, Barometric; Regulators, Draft, Combustion

DRAINS, TANK, FOR HOT WATER HEATING SYSTEM EXPANSION TANKS

Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Quality Specialty Co., Inc., Camden, N. J.
Richmond Engineering Co., Richmond, Va.
Thrush & Co., H. A., Peru, Ind.

DRAWING TEMPLATES, PIPING

See Templates, Drawing, Piping

DRIERS

See Dehydrators, Refrigerant

DRILLS, ELECTRIC AND PNEUMATIC, PORTABLE

Albertson & Co., Inc., Sioux City, Ia.
Black & Decker Mfg. Co., Towson, Md.
Buckeye Tools Corp., Dayton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Cincinnati Electrical Tool Co., The, Cincinnati, O.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Dayton Electric Mfg. Co., Chicago, Ill.
Demo-Haines Tool Corp., Enid, Okla.
Famco Machine Co., Kenosha, Wis.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Mall Tool Co., Div. of Remington Arms Co., Inc., Chicago, Ill.
Millers Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Molco Drilling Machines, Inc., Washington, D.C.
Nielsen, Inc., E. V., Stamford, Conn.
Oster Mfg. Co., John, Milwaukee, Wis.
Phillips Drill Co., Michigan City, Ind.
Portable Electric Tools, Inc., Chicago, Ill.
Porter-Cable Machine Co., Syracuse, N. Y.
Schramm, Inc., West Chester, Pa.
Skil Corp., Chicago, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago (Cicero), Ill.
Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Stanley Works, The, New Britain, Conn.
Syntron Co., Homer City, Pa.
Tempo Products Co., Cleveland, O.
Thor Power Tool Co., Aurora, Ill.
U. S. Electrical Tool Co., Cincinnati, O.
Wodack Electric Tool Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.

DRILLS, MASONRY

Arro Expansion Bolt Co., Marion, O.
Chicago Expansion Bolt Co., Chicago, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Demo-Haines Tool Corp., Enid, Okla.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
DoAll Co., The, Des Plaines, Ill.
Hamlin Co., Inc., J. F., San Francisco, Calif.
Holub Industries, Inc., Sycamore, Ill.
Mall Tool Co., Div. of Remington Arms Co., Inc., Chicago, Ill.
Metallurgical Products Dept. of General Electric Co., Detroit, Mich.
Molco Drilling Machines, Inc., Washington, D. C.
New England Carbide Tool Co., Inc., Medford, Mass.
Nielsen, Inc., E. V., Stamford, Conn.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Proto Tools, Los Angeles, Calif.
Rawlplug Co., Inc., The, New Rochelle, N. Y.
Schramm, Inc., West Chester, Pa.
Star Expansion N. Y., Inc., New York, N. Y.
Super Tool Co., Detroit, Mich.
Tempo Products Co., Cleveland, O.
Termite Drills, Inc., Pasadena, Calif.
Thor Tool Co., Aurora, Ill.
Threadwell Tap & Die Co., Greenfield, Mass.
U. S. Expansion Bolt Co., York, Pa.
Williams & Co., J. H., Buffalo, N. Y.
Wodack Electric Tool Corp., Chicago, Ill.

DRIVES, CHAIN

Boston Gear Works, Quincy, Mass.
Browning Mfg. Co., Maysville, Ky.
Chain Belt Co., Milwaukee, Wis.
CraneVeyor Corp., Los Angeles, Calif.
Dodge Mfg. Corp., Mishawaka, Ind.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Jeffrey Mfg. Co., Columbus, O.
Link Belt Co., Chicago, Ill.
Morse Chain Co., Ithaca, N. Y.
Ramsey Chain Co., Inc., Albany, N. Y.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Whitney Chain Co., Hartford, Conn.

DRIVES, COOLING TOWER FAN

Cleveland Worm & Gear Co., Cleveland, O.
Cone-Drive Gears Div., Michigan Tool Co., Detroit, Mich.
Doerr Electric Corp., Cedarburg, Wis.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Pritchard & Co. of California, J. F., Kansas City, Mo.

DRIVES, FLAT BELT

See also Belting, Leather and Belting, Rubber

American Pulley Co., Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Maysville, Ky.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Dodge Mfg. Corp., Mishawaka, Ind.
Goodrich Co., B. F., Akron, O.
New York Belting & Packing Co., Passaic, N. J.
Pyott Foundry & Machine Co., Chicago, Ill.
Rhoads & Sons, J. E., Wilmington, Del.
Williams & Son, I. B., Dover, N. H.
Wood's Sons Co., T. B., Chambersburg, Pa.

DRIVES, FLUID OR HYDRAULIC, FOR POWER TRANSMISSION

American Blower Corp., Detroit, Mich.
Dodge Mfg. Corp., Mishawaka, Ind.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Link Belt Co., Chicago, Ill.
Twin Disc Clutch Co., Rockford, Ill.
Warner Electric Brake & Clutch Co., Beloit, Wis.
Will-O-Hill Industries, Inc., Willoughby, O.

DRIVES, GEAR

Boston Gear Works, Quincy, Mass.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Falk Corp., Milwaukee, Wis.
Hewitt-Robins, Inc., Stamford, Conn.
Lima Electric Motor Co., The, Lima, O.
Link-Belt Co., Chicago, Ill.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Pyott Foundry & Machine Co., Chicago, Ill.
Reliance Electric Engineering Co., Cleveland, O.
U. S. Electrical Motors, Inc., Los Angeles, Calif.

DRIVES, POWER FOR PIPE THREADING

Beaver Pipe Tools, Inc., Warren, O.
Oster Mfg. Co., Cleveland, O.
Ridge Tool Co., Elyria, O.
Toledo Pipe Threading Machine Co., Toledo, O.

DRIVES, SHAFT MOUNTED

American Pulley Co., The, Philadelphia, Pa.
Falk Corp., Milwaukee, Wis.
Link-Belt Co., Chicago, Ill.
Philadelphia Gear Works, Inc., Philadelphia, Pa.

DRIVES, V BELT

Allis-Chalmers Mfg. Co., Milwaukee, Wis. (variable pitch)
American Pulley Co., Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Maysville, Ky.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dayton Rubber Co., Dayton, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Gates Rubber Co., The, Denver, Colo.
Goldens' Foundry & Machine Co., Columbus, Ga.
Goodrich Co., B. F., Akron, O.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Maurey Mfg. Corp., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Pyott Foundry & Machine Co., Chicago, Ill.
Speed Selector Inc., Chagrin Falls, O.
V-Belt Clutch Co., Los Angeles, Calif.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J.

DRIVES, VARIABLE SPEED

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical; Reducers, Speed; Pulleys and Sheaves, for Belt Drives

DRYERS FOR COMPRESSED AIR

See Dehumidifiers for Compressed Air

DRYERS, INDUSTRIAL (COMPARTMENT, TUNNEL CONVEYOR, VACUUM, SPRAY, ROTARY, ETC.)

Aerotec Corp., The, Greenwich, Conn.
Air & Refrigeration Corp., New York, N. Y.
Beltran Associates, Inc., Brooklyn, N. Y.
Biggs Boiler Works Co., The, E. Akron, O.
Blaw Knox Co., Buflovak Equipment Div., Buffalo. N. Y.
Bowen Engineering, Inc., North Branch, N. J.
Combustion Engineering Inc., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Griffin & Co., Louisville, Ky.
Jeffrey Mfg. Co., Columbus, O.
Kirk & Blum Mfg. Co., Cincinnati, O.
Link-Belt Co., Chicago, Ill.
Louisville Drying Machinery Unit, General American Transportation Corp., Louisville, Ky.
Mahon Co., R. C., The, Detroit, Mich.
Newcomb-Detroit Co., Detroit, Mich.
Niagara Blower Co., New York, N. Y.
Peters-Dalton, Inc., Detroit, Mich.
Proctor & Schwartz, Inc., Philadelphia, Pa.
Raymond Div., Combustion Engineering Inc., Chicago, Ill.
Ross Engineering Corp., J. O., New York, N. Y.
Struthers Wells Corp., Titusville, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Western Precipitation Corp., Los Angeles, Calif.
Whiting Corp., Harvey, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa.

DRYERS, REFRIGERANT

See Dehydrators, Refrigerant

DUAL THERMOSTATS

See Thermostats, Two Temperature or Dual

DUCT CONNECTIONS

See Connections, Duct, Flexible; Connectors for Non-Metallic Duct Fabrication

DUCT FURNACES

See Heaters, Duct

DUCT HEATERS

See Heaters, Duct

DUCT INSULATION

See Insulation, Duct

DUCT THERMOSTATS

See Thermostats, Duct Type

DUCT TURNING VANES

See Vanes, Duct Turning, Prefabricated

DUCTS AND DUCT FITTINGS, PREFABRICATED, FLEXIBLE, METALLIC

American Metal Hose Div., The American Brass Co., Waterbury, Conn.
Arrowhead Rubber Co., Long Beach, Calif.
Buckeye Furnace Pipe Co., Columbus, O.
Coleman Co., Inc., The, Wichita, Kans.
Flexonics Corp., Maywood, Ill.
Henry Furnace Co., The, Medina, O.
Littleford Bros., Inc., Cincinnati, O.
Round Oak Co., Inc., Dowagiac, Mich.
Solar Aircraft Co., San Diego, Calif.

DUCTS AND DUCT FITTINGS, PREFABRICATED, FLEXIBLE, NON-METALLIC

American Agile Corp., Bedford, O.
Arrowhead Rubber Co., Long Beach, Calif.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Flexaust Co., New York, N. Y.
Flexible Tubing Corp., Guilford, Conn.
Owens-Corning Fiberglas Corp., Toledo, O.
United States Rubber Co., New York, N. Y.
Wiremold Co., Hartford, Conn.

DUCTS AND DUCT FITTINGS, PREFABRICATED, NON-FLEXIBLE, METALLIC

Acer & Whedon, Inc., Medina, N. Y.
Acme Mfg. Co., Philadelphia, Pa.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Airfloor Co. of California, Southgate, Calif.
Ajax Furnace Fitting Co., Div. of Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Carrier Corp., Syracuse, N. Y. (spiral conduit)
Champion Furnace Pipe Co., Peoria, Ill.
Char-Gale Mfg. Co., Minneapolis, Minn.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Coleman Co., Inc., The, Wichita, Ks.
Corbman Bros., Inc., Philadelphia, Pa.
Damascus Tube Co., Greenville, Pa.
Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Ervite Corp., Erie, Pa.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Gray Metal Products, Inc., Rochester, N. Y.
Henry Furnace Co., The, Medina, O.
Howes-Woods Co., Cambridge, Mass.
Inland Steel Products Co., Milwaukee, Wis.
International Heater Co., Utica, N. Y.
Lamneck Div., Clayton & Lambert Mfg. Co., Middletown, O.
Lennox Industries, Inc., Columbus, O.
Lennox Industries, Inc., Marshalltown, Ia.
Lumm Co., A. H., Toledo, O.
Metal Fabricators, Inc., Charlotte, N. C.
Meyer & Bro. Co., F., Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
Ohio Valley Hardware Co., Inc., Evansville, Ind.
Olsen Mfg. Co., C. A., Elyria, O.
Pressure Airduct Corp., Skokie, Ill. (for high velocity systems)
Reeves Steel & Mfg. Co., Dover, O.
Round Oak Co., Inc., Dowagiac, Mich.
Schecter Brothers Co., Philadelphia, Pa.
Schoedinger, Inc., F. O., Columbus, O.
Sioux Steel Co., Sioux Falls, S. D.
United Sheet Metal Co., Inc., Columbus, O. (spiral lock seam)
United States Register Co., Battle Creek, Mich.
Viking Mfg. Corp., Cleveland, O.
Williamson Co., Cincinnati, O.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa. (Spiral conduit for high pressure air distribution)

DUCTS AND DUCT FITTINGS, PREFABRICATED, NON-FLEXIBLE, NON-METALLIC

American Agile Corp., Bedford, O.
Atlas Mineral Products Co., Mertztown, Pa.
Colonial Plastics Mfg. Co., Cleveland, O. (Unplasticized polyvinyl chloride)
General Ceramics Corp., Keasbey, N. J. (plastic)
Goethel Sheet Metal Wks., Inc., Alfred, Milwaukee, Wis.
Goodrich Industrial Products Co., B. F., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Haveg Industries, Inc., Newark, Del. (for fumes)
Heil Process Equipment Corp., Cleveland, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Johns-Manville, New York, N. Y.
Knight, Maurice A., Akron, O. (acid-proof)
Robinson Clay Product Co., The, Akron, O.
S & C Mfg. Co., Cincinnati, O. (plastic)
Sonoco Products Co., Hartsville, S. C.
United States Rubber Co., New York, N. Y.

DUCTS, FLEXIBLE

See Ducts and Duct Fittings, Prefabricated, Flexible, Non-Flexible, Metallic and Non-Metallic

DYE PENETRANT

See Penetrant, Dye

DUST COLLECTORS

See Collectors, Dust

DUST COUNTERS

See Counters, Dust

ECONOMIZERS, FUEL

Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Combustion Engineering Inc., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Foster Wheeler Corp., New York, N. Y.
Green Fuel Economizer Co., Beacon, N. Y.
Novelty Steam Boiler Wks., Inc., Baltimore, Md.
Richmond Engineering Co., Richmond, Va.
Springfield Boiler Co., Springfield, Ill.
Union Iron Works, Erie, Pa.

EJECTORS, SEWAGE

American-Marsh Pumps, Inc., Battle Creek, Mich.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davidson Co., M. T., New York, N. Y.
Nash Engineering Co., South Norwalk, Conn.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Swaby Mfg. Co., Chicago, Ill.
Weil Pump Co., Chicago, Ill.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

ELBOWS AND TEES, BALANCING, FOR HOT WATER HEATING AND CHILLED WATER SYSTEMS

Detroit Controls Corp., Detroit, Mich.
Dunham-Bush, Inc., West Hartford, Conn.
G & H Mfg. Co., Philadelphia, Pa.
Hammond Brass Works, Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kehm Corp., The, Chicago, Ill.
New York Brass Foundry, New York, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

ELECTRIC AIR CLEANERS

See Filters, Air, Electrostatic (with outside power source)

ELECTRIC DRILLS

See Drills, Electric, Portable

ELECTRIC MOTORS

See Motors, Electric

ELECTRIC PIPE HEATING SYSTEMS

See Systems, Electric Pipe Heating

ELECTRIC RADIANT HEATING

See Conductors and Panels, Electrical, for Radiant Heating

ELECTRIC SHEARS

See Shears, Electric, Portable

ELECTRIC UNIT HEATERS

See Heaters, Unit, Electric Heating Element

ELECTRIC WATER HEATERS

See Heaters, Water, Electric

ELECTRICAL AIR FILTERS

See Filters, Air, Electrostatic (with outside power source)

ELECTRODES, ARC WELDING

Air Reduction Co., Inc., New York, N. Y.
All-State Welding **Alloys** Co., Inc., White

Plains, N. Y.
Allegheny Ludlum Steel Corp., Pittsburgh, Pa. (Stainless)
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alloy Rods Co., York, Pa.
American Brass Co., Waterbury, Conn.
American Steel & Wire Div., United States Steel, Cleveland, O.
Ampco Metals, Inc., Milwaukee, Wis.
Arcos Corp., Philadelphia, Pa.
Burdett Oxygen Co. of Calif., Huntington Park, Calif.
Central Steel & Wire Co., Chicago, Ill.
Crucible Steel Co. of America, Pittsburgh, Pa.
Eutectic Welding Alloys Corp., Flushing, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Harnischfeger Corp., Milwaukee, Wis.
Hobart Bros. Co., Troy, O.
International Nickel Co., Inc., The, New York, N. Y.
Laclede Steel Co., St. Louis, Mo.
Lincoln Electric Co., Cleveland, O.
Mallory Co., P. R., The, Indianapolis, Ind.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Maurath, Inc., Cleveland, O.
McKay Co., Pittsburgh, Pa.
Metal & Thermit Corp., Rahway, N. J.
Miller Electric Mfg. Co., Inc., Appleton, Wis.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif. (for hard facing)
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Cylinder Gas Co., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O.
Smith Corp., A. O., Milwaukee, Wis.
Trindl Products, Ltd., Chicago, Ill.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.

ELECTRODES, OIL BURNER

Auburn Sparkplug Co., Inc., Auburn, N. Y.
Crown Engineer Corp., Keyport, N. J.
Dielectric Products Co., Inc., Jersey City, N. J.
Steinen Mfg. Co., Wm., Newark, N. J.

ELECTROSTATIC AIR FILTERS

See Filters, Air, Electrostatic (with outside power source)

ELIMINATORS, AIR, FOR HEATING AND PIPING SYSTEMS

Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Armstrong Machine Works, Three Rivers, Mich.
Baseline Mfg. Corp., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Dole Valve Co., The, Morton Grove, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
General Automatic Products Corp., Baltimore, Md.
Gorton Heating Corp., Cranford, N. J.
Granberg Corp., Oakland, Calif.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kaye & McDonald, Inc., West Orange, N. J.
Keeney Mfg. Co., Newington, Conn.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
Moreheat Distribution, Inc., Cincinnati, O.
Multiplex Mfg. Co., Berwick, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Quality Specialty Co., Inc., Camden, N. J.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Southern Plastics Co., Columbia, S. C.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Watkins Co., J. E., Maywood, Ill.
Webster & Co., Warren, Camden, N. J.
Wright-Austin Co., Detroit, Mich.

ELIMINATORS, SLUG, REFRIGERANT

Blazer & Son, M., Passaic, N. J.
Patterson-Kelley Co., The, East Stroudsburg, Pa.
Southern Plastics Co., Columbia, S. C.
Watkins Co., J. E., Maywood, Ill.

ENAMELS AND LACQUERS

Acorn Paint & Chemical Co., Cleveland, O.
Arco Co., The, Cleveland, O.
Atlas Powder Co., Industrial Finishes Dept., North Chicago, Ill.
Barreled Sunlight Paint Co., Providence, R. I.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (pipeline and waterworks enamels)
Blue Ridge Talc Co., Inc., Henry, Va.
Claronex Products, Inc., Brooklyn, N. Y.
Cordo Chemical Corp., Norwalk, Conn.
Corrosion Control Co., Inc., New York, N. Y.
Debevoise Co., The, Brooklyn, N. Y.
Dixon Crucible Co., Joseph, Jersey City, N. J.
du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Heresite & Chemical Co., Manitowoc, Wis. (air dry phenolic & chlorinated rubber coatings)
Hilo Varnish Corp., Div. of Carpenter-Morton Co., Everett, Mass.
Horn Co., Inc., A. C., Long Island City, N. Y.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Interchemical Corp., Finishes Div., Newark, N. J.
Irvington Varnish and Insulator, Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Knight, Maurice A., Akron, O.
Koppers Co., Inc., Pittsburgh, Pa.
Master Mechanics Co., Cleveland, O.
Metal & Thermit Corp., Rahway, N. J.
National Lead Co., New York, N. Y.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Quigley Co., Inc., New York, N. Y.
Reilly Tar & Chemical Corp., Indianapolis, Ind.
Ronor Corp., Cleveland, O. (Spray units)
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sandstrom Products Co., Port Byron, Ill.
Sherwin-Williams Co., The, Cleveland, O.
Sipe & Co., James B., Pittsburgh, Pa.
Sonneborn Sons, Inc., L., New York, N. Y.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Steelcote Mfg. Co., St. Louis, Mo.
Thompson and Co., Oakmont, Pa.
Tropical Paint Co., Cleveland, O.
Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich.
Valdura Div., American-Marietta Co., Chicago, Ill.
Warren Refining & Chemical Co., The, Cleveland, O.
Watson-Standard Co., Pittsburgh, Pa.
Wilbur & Williams Co., Brighton, Mass.
Wilhelm Co., A., Reading, Pa.

ENCLOSURES FOR PERIMETER AIR CONDITIONING SYSTEMS AND AIR CONDITIONING UNITS

Brandt & Co., Inc., Eugene J., Long Island City, N. Y.
Somers Corp., Detroit, Mich.

ENCLOSURES, RADIATOR

Brandt & Co., Inc., Eugene J., Long Island City, N. Y.
Diamond Mfg. Co., Wyoming, Pa.
Hendrick Mfg. Co., Carbondale, Pa.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Somers Corp., Detroit, Mich.
Stedco Products, Wilkes-Barre, Pa
United Sheet Metal Co., Inc., Columbus, O.

ENGINES, DIESEL, FOR FAN, PUMP AND COMPRESSOR DRIVES

Alco Products, Inc., Schenectady, N. Y.
Anderson Diesel Engine Co., Philadelphia, Pa.
Berry-Hill Corp., Hill Diesel Engine Div., Providence, R. I.
Buda Div., Allis-Chalmers Mfg. Co., Harvey, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich.
Fairbanks, Morse & Co., Chicago, Ill.
Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, O.
Harnischfeger Corp., Milwaukee, Wis.
Ingersoll-Rand Co., New York, N. Y.
Ready-Power Co., The, Detroit, Mich.
Synchro-Start Products, Inc., Skokie, Ill. (automatic controls to start, stop and protect internal combustion engines)
Waukesha Motors Co., Waukesha, Wis.
Worthington Corp., Harrison, N. J.

ENGINES, GAS, FOR FAN, PUMP AND COMPRESSOR DRIVES

Buda Div., Allis-Chalmers Mfg. Co., Harvey, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Fairbanks, Morse & Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
LeRoi Div., Westinghouse Air Brake Co., Milwaukee, Wis.
Ready-Power Co., The, Detroit, Mich.
Synchro-Start Products, Inc., Skokie, Ill. (automatic controls to start, stop and protect internal combustion engines)
Waukesha Motor Co., Waukesha, Wis.
Worthington Corp., Harrison, N. J.

ENGINES, STEAM, FOR FAN, PUMP AND COMPRESSOR DRIVES

Skinner Engine Co., Erie, Pa.
Troy Engine & Machine Co., Troy, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Wachs Co., E. H., The, Chicago, Ill.
Westinghouse Electric Corp., Pittsburgh, Pa

EQUIPMENT, BALANCING

Bear Mfg. Co., Industrial Div., Rock Island, Ill. (dynamic)
Gisholt Machine Co., Madison, Wis.
Olsen Testing Machine Co., Tinius, Willow Grove, Pa.

EVAPORATIVE CONDENSERS

See Condensers, Refrigerating, Evaporative

EVAPORATIVE COOLERS

See Units, Air Conditioning, Summer, Evaporative Cooling Type

EVAPORATORS

See Chillers, Water

EXCHANGERS, HEAT

Acme Industries, Inc., Jackson, Mich.
Adams Co., Inc., R. P., Buffalo, N. Y. (liquid to gas)
Aerco Corp., Northvale, N. J.
Aerofin Corp., Syracuse, N. Y.
Alberger Heater Div., ADSCO Industries, Inc., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
Armstrong Co., Richard M., Westchester, Pa
Bell & Gossett Co., Morton Grove, Ill.
Beltran Associates, Inc., Brooklyn, N. Y.
Biggs Boiler Wks., Co., The, E. Akron, O.
Binks Mfg. Co., Chicago, Ill.
Blaw Knox Co., Buflovak Equipment Div., Buffalo, N. Y.
Brown Fintube Co., The, Elyria, O.
Buxton Mfg. Co., Dover, N. J.
Cleaver-Brooks Co., Milwaukee, Wis.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. Y.
Cooley Co., E. C., San Francisco, Calif.
Corning Glass Works, Corning, N. Y.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., Somerville, Mass.
Davis Engineering Corp., Elizabeth, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa

Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Dowingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Duriron Co., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
Electric Steel Foundry Co., Portland, Ore.
Fedders-Quigan Corp., Buffalo, N. Y.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Foster Wheeler Corp., New York, N. Y.
Frick Co., Waynesboro, Pa.
Gabriel Boiler Co., Portland, Ore.
General Ceramics Corp., Keasbey, N. J. (Impervious Graphite)
General Fittings Co., East Greenwich, R. I.
Gilbert Brass Foundry Co., St. Louis, Mo.
Graham Mfg. Co., Inc., New York, N. Y.
Graver Water Conditioning Co., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Haveg Industries, Inc., Newark, Del. (plastic)
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Heil Process Equipment Corp., Cleveland, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Industrial Filter & Pump Co., Chicago, Ill.
Joy Mfg. Co., Pittsburgh, Pa.
Kaiser Co., E. B., Glenview, Ill.
Kellogg Co., M. W., The, New York, N. Y.
Killebrew Engineering Corp., St. Louis, Mo.
Kopperman & Sons, Joseph, Philadelphia, Pa.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lindy Heaters, Inc., New York, N. Y.
Madden Corp., The, Chicago, Ill.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Manning & Lewis Engineering Co., Newark, N. J.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Mueller Brass Co., Port Huron, Mich.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Pipe Bending Co., New Haven, Conn.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Nooter Corp., St. Louis, Mo.
Novelty Steam Boiler Works, Inc., Baltimore, Md.
Olin Mathieson Chemical Corp., Western Brass Mills Div., East Alton, Ill. (roll bonded panels incorporating fluid passages)
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Quaid Fabrications, Inc., Philadelphia, Pa.
Refrigeration Appliances, Inc., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Ross Heat Exchanger Div., American Radiator & Standard Sanitary Corp., Buffalo, N. Y.
Schaub Engineering Co., Fred H., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Shutt Process Equipment Corp., St. Louis, Mo.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
Stout & Sons, David, St. Louis, Mo.
Struthers Wells Corp., Titusville, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taco Heaters, Inc., Cranston, R. I.
Techniflex Corp., Port Jervis, N. Y.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Thermo-Wheel, Inc., Far Rockaway, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Union Iron Works, Erie, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vapor Heating Corp., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Whitlock Mfg. Co., W. Hartford, Conn.
Wiegand Co., Edwin L., Pittsburgh, Pa. (electric)
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., Bronx, N. Y.

EXCHANGERS, HEAT, REFRIGERANT SUCTION LINE

Acme Industries, Inc., Jackson, Mich.
Armstrong Co., Richard M., Westchester, Pa.
Brown Fintube Co., The, Elyria, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa.
Gerstein & Cooper, Inc., South Boston, Mass.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Kaiser Co., E. B., Glenview, Ill.
Kramer Trenton Co., Trenton, N. J.
Marlo Coil Co., St. Louis, Mo.
Mueller Brass Co., Port Huron, Mich.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Rempe Co., Chicago, Ill.
Super Radiator Corp., Minneapolis, Minn.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Trane Co., The, La Crosse, Wis.
Tranter Mfg. Inc., Lansing, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
Watkins Co., J. E., Maywood, Ill.
Witt Co., A. H., Los Angeles, Calif.

EXHAUST HEADS

See Heads, Exhaust, for Pipe Lines

EXHAUST VENTILATION FITTINGS

See Fittings, Exhaust, Garage, for Attaching Car Exhaust Pipe

EXHAUSTERS, WELDING FUME

Aladdin Heating Corp., San Leandro, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American Blower Corp., Detroit, Mich.
American Machine Products Co., Marshalltown, Ia.
Ammerman Co., Inc., Minneapolis, Minn.
Atmos Corp., Chicago, Ill.
Bertram Co., Harvey P., The, Cincinnati, O.
Black Mfg. Co., Livingston, N. J.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Coppus Engineering Corp., Worcester, Mass.
Dana Fan & Blower Corp., Cincinnati, O.
Day Co., The, Minneapolis, Minn.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Gallaher Co., The, Omaha, Neb.
General Blower Co., Morton Grove, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Kice Metal Products Co., Wichita, Kans.
Kirk & Blum Mfg. Co., Cincinnati, O.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Mine Safety Appliances Co., Pittsburgh, Pa.
Peters-Dalton, Inc., Detroit, Mich.
Ruemelin Mfg. Co., Milwaukee, Wis.
Torit Mfg. Co., St. Paul, Minn.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.
Wing Mfg. Co., L. J., Linden, N. J.

EXPANDERS, TUBE

Chicago Pneumatic Tool Co., New York, N. Y.
Crane Packing Co., Morton Grove, Ill.
Elliott Co., Jeannette, Pa.
Talon Tools, Inc., North Arlington, N. J.
Vernon Tool Co., Ltd., Alhambra, Calif.
Wilson, Inc., Thomas C., Long Island City, N. Y.

EXPANSION BENDS

See Bends, Expansion

EXPANSION BOLTS

See Bolts, Expansion

EXPANSION JOINTS

See Joints, Pipe Expansion

EXPANSION TANKS

See Tanks, Expansion, for Hot Water Heating Systems

EXPANSION VALVES

See Valves, Refrigeration

EXTENSIONS, FURNACE, WATER WALL, FOR BOILERS

Crotty Mfg. Corp., Flushing, L. I., N. Y.

EXTRACTORS, PIPE

Chicago Specialty Mfg. Co., Chicago, Ill.
Greenfield Tap & Die Corp., Greenfield, Mass.
Ridge Tool Co., Elyria, O.
Roddick Tool Co., Anaheim, Calif.
Talon Tools, Inc., North Arlington, N. J. (internal wrenches)
Walton Co., Hartford, Conn.

FABRICATED PIPING

See Bends; Headers; etc.

FABRICATORS, PIPE

See Headers, Pipe, Welded; and Coils, Pipe

FAN BALANCING EQUIPMENT

See Equipment, Balancing

FAN BASES

See Bases and Pads, Vibration Isolating

FAN BLADES

See Blades, Propeller Fan

FAN-COIL UNITS

See Units, Air Conditioning, Year Around, Fan-Coil Type

FAN HOUSINGS

See Housings, Fan, Centrifugal

FANS, AXIAL FLOW, PRESSURE TYPE

Aerovent Fan Co., Inc., Piqua, O. (Tubeaxial and vanexial)
Alloy Propeller, Zelionople, Pa. (Tubeaxial)
American Blower Corp., Detroit, Mich. (tubeaxial and vaneaxial)
Bahnson Co., Winston-Salem, N. C. (Vaneaxial)
Bertram Co., Harvey P., The, Cincinnati, O.
Buffalo Forge Co., Buffalo, N. Y.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J. (tubeaxial)
Chicago Blower Corp., Franklin Park, Ill. (tubeaxial)
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Detroit Blower Corp., Franklin Park, Ill.
Dynamic Air Engineering, Inc., Los Angeles, Calif.
General Blower Co., Morton Grove, Ill.
Hartzell Propeller Fan Co., Piqua, O. (tubeaxial and vaneaxial)
Ilg Electric Ventilating Co., Chicago, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (PVC) (tubeaxial)
International Engineering Inc., Dayton, O.
Joy Mfg. Co., Pittsburgh, Pa. (vaneaxial)
Kody Blower Co., Trenton, N. J. (tubeaxial

and vaneaxial)
Lennox Industries, Inc., Marshalltown, Ia. (vaneaxial)
M & E Mfg. Co., Indianapolis, Ind. (tubeaxial)
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif. (tubeaxial & vaneaxial)
Moore Co., The, Marceline, Mo. (tubeaxial and vaneaxial)
Propellair Div., Robbins & Myers, Inc., Springfield, O. (tubeaxial and vaneaxial)
Robinson Ventilating Co., Zelienople, Pa.
South Bend Air Products, Inc., South Bend, Ind.
Stanat Mfg. Co., Inc., Long Island City, N. Y. (vaneaxial—*2* to 6 in. diameter)
Trade-Wind Motorfans, Inc., Rivera, Calif.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J. (tubeaxial and vaneaxial)

FANS, CENTRIFUGAL

Advance Aluminum Castings Corp., Chicago, Ill.
Air Conditioning Engineering Co., Cambridge, Mass.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Air Fan Engineering Co., Los Angeles, Calif.
Airwasher Corp., Eaton Rapids, Mich.
Aladdin Heating Corp., San Leandro, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
Alloy Propeller, Zelionople, Pa. (Stainless Steel)
American Agile Corp., Bedford, O.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Foundry & Furnace Co., Bloomington, Ill.
American Machine Products Co., Marshalltown, Ia.
Ammerman Co., Inc., Minneapolis, Minn.
Barry Blower Co., Minneapolis, Minn.
Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Bayley Blower Co., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brookside Corp., McCordsville, Ind.
Brundage Co., The, Kalamazoo, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Burdett Mfg. Co., Chicago, Ill.
Campbell Heating Co., Des Moines, Ia.
Carolina Blower Co., Inc., Greensboro, N. C. (shaving exhauster)
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
Coppus Engineering Corp., Worcester, Mass.
Day Co., The, Minneapolis, Minn.
Dayton Electric Mfg. Co., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Fasco Industries, Inc., Rochester, N. Y.
Fedders-Quigan Corp., Buffalo, N. Y.
Frigid, Inc., Brooklyn, N. Y.
Gallaher Co., The, Omaha, Neb.
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
General Ceramics Corp., Keasbey, N. J. (ceramics, plastic)
Green Fuel Economizer Co., Beacon, N. Y.
Hartzell Propeller Fan Co., Piqua, O.
Hastings Air Control, Inc., Omaha, Nebr.
Heil Process Equipment Corp., Cleveland, O. Solid plastic and coated solid plastic, and rubber lined)
Ilg Electric Ventilating Co., Chicago, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Jackson & Church Co., Saginaw, Mich.
Jamieson Mfg. Co., Dallas, Tex.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Kice Metal Products Co., Wichita, Kans.
Lau Blower Co., Dayton, O.
Lehigh Fan & Blower Co., Div. of Fuller Co., Catasauqua, Pa.
Lennox Industries, Inc., Marshalltown, Ia.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
Morrison Products, Inc., Cleveland, O.
Mountain States Equipment Co., Denver, Colo.
Mueller Climatrol, Milwaukee, Wis.
National Engineering & Mfg. Co., Sedalia, Mo.
New York Blower Co., Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Niagara Blower Co., New York, N. Y.
Northern Blower Co., Cleveland, O.
Palmer Mfg. Co., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Phelps Mfg. Co., Little Rock, Ark.
Power Engineering Co., Chicago, Ill.
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Redmond Co., Inc., Owosso, Mich.
Reynolds Mfg. Co., The, Comstock Park, Mich.
Revcor Inc., Carpentersville, Ill.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Robinson Ventilating Co., Zelienople, Pa.
Small Motors, Inc., Chicago, Ill. (small sizes)
Standard Electric Mfg. Co., West Berlin, N. J.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Trade-Wind Motorfans, Inc., Rivera, Calif.
Trane Co., The, LaCrosse, Wis.
Tuck-Aire Furnace Co., San Francisco, Calif.
United Electric Co., Wichita Falls, Tex.
United States Air Conditioning Corp., Philadelphia, Pa.
Universal Electric Co., Owosso, Mich.
Utility Appliance Corp., Los Angeles, Calif.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Viking Air Products, Div. of National-U. S. Radiator Corp., Cleveland, O.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

FANS, MATERIALS HANDLING

Air Conditioning Engineering Co., Cambridge, Mass.
Air Fan Engineering Co., Los Angeles, Calif.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Bayley Blower Co., Milwaukee, Wis.
Buffalo Forge Co., Buffalo, N. Y.
Century Fan & Ventilator Co., Stamford, Conn.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
Detroit Blower Corp., Franklin Park, Ill.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
Kody Blower Co., Trenton, N. J.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
Newcomb-Detroit Co., Detroit, Mich.
New York Blower Co., Chicago, Ill.
Peerless Electric Co., Warren, O.
Phelps Mfg. Co., Little Rock, Ark.

FANS, MECHANICAL DRAFT, FOR BOILERS

American Blower Corp., Detroit, Mich.
Ammerman Co., Inc., Minneapolis, Minn.
Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Bayley Blower Co., Milwaukee, Wis.
Bertram Co., Harvey P., The, Cincinnati, O.
Bressler Engineering Service, Oregon, Ill.
Brookside Corp., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Century Fan & Ventilator Co., Stamford, Conn.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Gallaher Co., The, Omaha, Neb.
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
Green Fuel Economizer Co., Beacon, N. Y.
International Engineering, Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Kol-Master Corp., Oregon, Ill.
Lehigh Fan & Blower Co., Div. of Fuller Co., Catasauqua, Pa.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
Quickdraft Co., Canton, O.
Robinson Ventilating Co., Zelienople, Pa.
Tjernlund Mfg. Co., St. Paul, Minn.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Whitty Co., Inc., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

FANS, PROPELLER

Acme Equipment Co., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Aire-Foile Fan & Blower Co., Detroit, Mich.
Airmaster Corp., Chicago, Ill.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
Alloy Propeller, Zelionople, Pa. (Stainless Steel)
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Coolair Corp., Jacksonville, Fla.
Ammerman Co., Inc., Minneapolis, Minn.
Baldor Electric Co., St. Louis, Mo.
Bar-Brook Mfg. Co., Inc., Shreveport, La.
Belco Industries, Inc., St. Louis, Mo.
Bertram Co., Harvey P., The, Cincinnati, O.
Biglin & Co., Inc., H. C., Atlanta, Ga.
Bishop & Babcock Mfg. Co., Cleveland, O.
Broan Mfg. Co., Inc., Hartford, Wis.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brookside Corp., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Burden Co., Alan E., Los Angeles, Calif.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. Y.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
Coppus Engineering Corp., Worcester, Mass.
Dayton Electric Mfg. Co., Chicago, Ill.
De Bothezat Fans Div., American Machine & Metals, Inc., New York, N. Y.
Detroit Blower Corp., Franklin Park, Ill.
DeVilbiss Co., The, Toledo, O.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Dynamic Air Engineering, Inc., Los Angeles.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fasco Industries, Inc., Rochester, N. Y.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
Frigid, Inc., Brooklyn, N. Y.
Gallaher Co., The, Omaha, Nebr.
General Blower Co., Morton Grove, Ill.
Hartzell Propeller Fan Co., Piqua, O.
Hill Co., Francis, Cleveland, O.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
International Engineering, Inc., Dayton, O.
Jamieson Mfg. Co., Dallas, Tex.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Kody Blower Co., Trenton, N. J.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Lau Blower Co., Dayton, O.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
McGraw Electric Co., Lonergan Mfg. Div., Albion, Mich.
McLarty Systems, Battle Creek, Mich.

Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Moore Co., The, Marceline, Mo.
Morrill Motors, Ft. Wayne, Ind.
Mountain States Equipment Co., Denver.
Muckle Mfg. Co., Owatonna, Minn.
Murray Co. of Texas, The, Atlanta, Ga.
Myers Electric Co., Inc., Pittsburgh, Pa.
National Engineering & Mfg. Co., Sedalia, Mo.
National Gas Equipment Co., Inc., Denison, Tex.
New York Blower Co., Chicago, Ill.
Peerless Electric Co., Warren, O.
Perkins & Son, Inc., B. F., Holyoke, Mass.
Phelps Mfg. Co., Little Rock, Ark.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Propellair Div., Robbins & Myers, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.
Reynolds Electric Co., River Grove, Ill.
Robinson Ventilating Co., Zelienople, Pa.
Schwitzer Corp., Indianapolis, Ind.
South Bend Air Products, Inc., South Bend, Ind.
Standard Electric Mfg. Co., West Berlin, N. J.
Sutton Corp., O. A., The, Wichita, Kan.
Swift Mfg. Co., Inc., Royal Oak, Mich.
Thermador Electrical Mfg., Los Angeles, Calif.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Trade-Wind Motorfans, Inc., Rivera, Calif.
Trane Co., The, LaCrosse, Wis.
Truflo Fan Co., Harmony, Pa.
United Electric Co., Wichita Falls, Tex.
Viking Air Products, Div. of National-U. S. Radiator Corp., Cleveland, O.
Western Blower Co., Seattle, Wash.
Western Engineering & Mfg. Co., Venice, Calif.
Westinghouse Electric Corp., Electric Appliance Div., E. Springfield, Mass.
Wind-Way Fan & Ventilating Co., New Orleans, La.
Wing Mfg. Co., L. J., Linden, N. J.

FASTENERS, INSULATION

Acme Steel Co., Chicago, Ill (steel strapping)
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Gerrard & Co., A. J., Melrose Park, Ill.
Graham Mfg. Corp., Royal Oak, Mich.
Holub Industries, Inc., Sycamore, Ill.
Huck Mfg. Co., Detroit, Mich.
Lexsuco, Inc., Cleveland, O.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Detroit, Mich.
Miracle Adhesives Corp., Bellmore, N. Y.
Moore, Inc., Goodloe E., Danville, Ill.
Nelson Stud Welding Div., Gregory Industries Inc., Lorain, O.
Phillips Drill Co., Michigan City, Ind.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Cleveland, O. (powder-actuated)
Remington Arms Co., Inc., Bridgeport, Conn.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.
Tinnerman Products, Inc., Cleveland, O.
United Carr Fastener Corp., Cambridge, Mass.

FASTENERS, POWDER OPERATED

du Pont de Nemours & Co., E. I., Wilmington, Del. (blind expansion)
Omark Industries, Portland, Ore.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Cleveland, O.
Remington Arms Co., Inc., Bridgeport, Conn.
Tempo Products Co., Cleveland, O.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.

FEEDFRS, CHEMICAL, PROPORTIONING

American Water Softener Co., Philadelphia, Pa.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Black, Sivalls & Bryson Inc., Kansas City, Mo.
Calgon, Inc., Pittsburgh, Pa.
Cochrane Corp., Philadelphia, Pa.
Dearborn Chemical Co., Chicago, Ill.
Elgin Softener Corp., Elgin, Ill.
Fischer & Porter Co., Hatboro, Pa.
Graver Water Conditioning Co., New York, N. Y.
Hungerford & Terry, Inc., Clayton, N. J.
Jeffrey Mfg. Co., Columbus, O.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Myers & Bros. Co., F. E., The, Ashland, O.
Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I. (liquid and dry)
Permutit Co., New York, N. Y.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Research Appliance Co., Allison Park, Pa.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Smith Chemical Co., E. W., La Puente, Calif.
Wallace & Tiernan, Inc., Belleville, N. J.

FEEDERS, WATER, HEATING BOILER

Acker Corp., Meridian, Miss.
Bailey Co., Chas. M., San Francisco, Calif.
Calgon, Inc., Pittsburgh, Pa.
Campbell Co., J. A., Long Beach, Calif.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Magnetrol, Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Morehead Mfg. Co., Detroit, Mich.
Nason Co., Clarkston, Mich.
Schaub Engineering Co., Fred H., Chicago, Ill.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

FEEDWATER HEATERS

See Deaerators

FIBER PACKING

See Packing, Fiber

FIBER PIPE

See Pipe, Fiber

FILTER GAGES

See Gages, Air Filter

FILTER OILS

See Oils, for Coating Viscous Air Filters

FILTERS, AIR, AUTOMATIC, DRY

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Air-Stream Filter Corp., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
Bahnson Co., Winston-Salem, N. C.
Day Co., The, Minneapolis, Minn.
Dollinger Corp., Rochester, N. Y.
Gray Co., Inc., Minneapolis, Minn.
Green Fuel Economizer Co., Beacon, N. Y.
Hanna Engineering Works, Chicago, Ill.
Leavitt Machine Co., Orange, Mass.
Trion, Inc., McKees Rocks, Pa.

FILTERS, AIR, AUTOMATIC, VISCOUS

Air-Maze Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Continental Air Filters, Inc., Louisville, Ky.
Farr Co., Los Angeles, Calif.
Trion, Inc., McKees Rocks, Pa.

FILTERS, AIR, ELECTRIC

See Filters, Air, Electrostatic (with outside power source)

FILTERS, AIR, ELECTRICAL

See Filters, Air, Electrostatic (with outside power source)

FILTERS, AIR, ELECTROSTATIC

(with outside power source)

Air-Maze Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Dollinger Corp., Rochester N. Y.
Electro-Air Cleaner Co., Pittsburgh, Pa.
Radex Corp., Chicago, Ill.
Trion, Inc., McKees Rocks, Pa.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

FILTERS, AIR, GREASE

Specifically designed for kitchen exhaust systems

Air Devices, Inc., New York, N. Y.
Air Filter Corp., Milwaukee, Wis.
Air-Maze Corp., Cleveland, O.
Air-Stream Filter Corp., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
Barnebey-Cheney Co., Columbus, O.
Continental Air Filters, Inc., Louisville, Ky.
Cuno Engineering Co., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Evans Corp., The, George, Moline, Ill.
Farr Co., Los Angeles, Calif.
Research Products Corp., Madison, Wis.
Smith Filter Corp., Moline, Ill. (Aluminum)
Trion, Inc., McKees Rocks, Pa.
Vortox Co., Claremont, Calif.

FILTERS, AIR, PANEL, DRY

Aluminum Wool Div., Carey Electronic Engineering Co., Springfield, O.
American Air Filter Co., Inc., Louisville, Ky.
Barnebey-Cheney Co., Columbus, O.
Cambridge Filter Corp., Syracuse, N. Y.
Continental Air Filters, Inc., Louisville, Ky.
Coppus Engineering Corp., Worcester, Mass.
Cuno Engineering Co., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Drico Industrial Corp., Passaic, N. J.
Ducon Co., The, Mineola, N. Y.
Farr Co., Los Angeles, Calif.
Filt-R-Ite Co., Chicago, Ill.
Hadley Products Co., Marietta, O.
Master Products Co., Chicago, Ill.
Microtron Corp., Charlotte, N. C.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Peden Equipment Co., Houston, Texas
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Permaglass, Inc., Toledo, O.
Research Products Corp., Madison, Wis.
Somers Corp., Detroit, Mich.
Stoddard Industries, Inc., Chicago, Ill.

FILTERS, AIR, PANEL, VISCOUS

Air Devices, Inc., New York, N. Y.
Air Filter Corp., Milwaukee, Wis.
Air-Maze Corp., Cleveland, O.
Air-Stream Filter Corp., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
Besser Metal Products Corp., Charlotte, N. C.
Carey Electronic Engineering Co., Metal Wool Div., Springfield, O.
Celanese Corp. of America, New York, N. Y.
Continental Air Filters, Inc., Louisville, Ky.
Dollinger Corp., Rochester, N. Y.
Evans Corp., The, George, Moline, Ill.
Farr Co., Los Angeles, Calif.
Goodyear Tire & Rubber Co., Akron, O.
Microtron Corp., Charlotte, N. C.
Research Products Corp., Madison, Wis.
Smith Filter Corp., Moline, Ill. (Aluminum)
Trion, Inc., McKees Rocks, Pa.
Vortox Co., Claremont, Calif.

FILTERS, AIR, UNIT, THROW-AWAY

Airgard Mfg. Co., Chicago, Ill.
Air-Maze Corp., Cleveland, O.
Air-Stream Filter Corp., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
Barnebey-Cheney Co., Columbus, O.
Bowman Co., D. F., New Albany, Ind. (Special sizes)
C.L.B. Co., Houston, Tex.
Cambridge Filter Corp., Syracuse, N. Y. (absolute filters)
Cuno Engineering Co., Meriden, Conn.
Drico Industrial Corp., Passaic, N. J.
Easton Air Filter Co., Detroit, Mich.
Farr Co., Los Angeles, Calif.
Filt-R-Ite Co., Chicago, Ill.
Flanders Mill, Inc., Riverhead, Long Island, N. Y.
Microtron Corp., Charlotte, N. C.

Mine Safety Appliances Co., Pittsburgh, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Owens-Corning Fiberglas Corp., Toledo, O.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Process Development, Inc., Genoa, O.
Research Products Corp., Madison, Wis.
Standard Asbestos Mfg. Co., Chicago, Ill.
Technical Filter Co., Chicago, Ill.
Wilson & Co., Inc., Chicago, Ill.

FILTERS FOR OIL BURNERS

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Andale Co., Philadelphia, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Commercial Filters Corp., Melrose, Mass.
Cuno Engineering Corp., Meriden, Conn.
Eddington Metal Specialty Co., Eddington, Pa.
Fram Corp., Providence, R. I.
General Filters, Inc., Novi, Mich.
Hauck Mfg. Co., Brooklyn, N. Y.
Hilliard Corp., Elmira, N. Y.
Marvel Engineering Co., Chicago, Ill.
McIntire Co., The, Livingston, N. J.
Meldon Industries Div., Tool Industries, Inc., Detroit, Mich.
Morse-Smith-Morse Co., The, Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Purolator Products, Inc., Rahway, N. J.
Rega Mfg. Co., Rochester, N. Y.
Sette Products Co., Oakland, Calif.
Sparkler Mfg. Co., Mundelein, Ill.
Unifilter Co., Farmington, Mich.
W. G. B. Oil Clarifier, Inc., Kingston, N. Y.
Winslow Engineering & Mfg. Co., Oakland, Calif.
Wood Mfg. Co., A. R., Luverne, Minn.

FILTERS, ODOR

See Adsorbers, Odor

FILTERS, PIPE LINE

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Adams Co., Inc., R. P., Buffalo, N. Y.
Air-Maze Corp., Cleveland, O.
Alco Products, Inc., Schenectady, N. Y.
Alco Valve Co., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
American Meter Co., Inc., Philadelphia, Pa.
Andale Co., Philadelphia, Pa.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
CCA Products, Inc., Glendale, Calif.
Commercial Filters Corp., Melrose, Mass.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Cuno Engineering Corp., Meriden, Conn.
DeVilbiss Co., The, Toledo, O.
Dollinger Corp., Rochester, N. Y.
Eddington Metal Specialty Co., Eddington, Pa.
Emco Pneumatic Corp., Des Moines, Ia.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Fisher Governor Co., Marshalltown, Ia.
Fram Corp., Providence, R. I.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Filters, Inc., Novi, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Kraissl Co., Inc., The, Hackensack, N. J.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Marvel Engineering Co., Chicago, Ill.
McIntire Co., The, Livingston, N. J.
Micro Metallic Corp., Glen Cove, N. Y.
Moraine Products Div., General Motors Corp., Dayton, O. (Porous metal)
Newark Wire Cloth Co., Newark, N. J.
Norgren Co., C. A., Englewood, Colo.
Norwalk Valve Co., South Norwalk, Conn.
Porous Plastic Filter Co., Glen Cove, N. Y.
Roylyn, Inc., Glendale, Calif.
Scientific Instrument Co., Detroit, Mich.
Selas Corp. of America, Dresher, Pa.
Standard Machine & Mfg. Co., St. Louis, Mo.
Trerice Co., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
Unifilter Co., Farmington, Mich.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Watts Regulator Co., Lawrence, Mass.
Winslow Engineering & Mfg. Co., Oakland, Calif.
Worthington Corp., Harrison, N. J.

FILTERS, REFRIGERANT

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Alco Products, Inc., Schenectady, N. Y.
Alco Valve Co., St. Louis, Mo.
Commercial Filters Corp., Melrose, Mass.
Cuno Engineering Corp., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Eddington Metal Specialty Co., Eddington, Pa.
Hannifin Corp., DesPlaines, Ill.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
McIntire Co., The, Livingston, N. J.
Moraine Products Div., General Motors Corp., Dayton, O. (Porous metal)
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Phillips & Co., H. A., Chicago, Ill.
Porous Plastic Filter Co., Glen Cove, N. Y.
Remco, Inc., Zelienople, Pa.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Standard Machine & Mfg. Co., St. Louis, Mo.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.

FILTERS, WATER

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Adams Co., Inc., R. P., Buffalo, N. Y.
Alco Products, Inc., Schenectady, N. Y.
Alco Valve Co., St. Louis, Mo.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Andale Co., Philadelphia, Pa.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Austin Engineering & Mfg. Co., Inc., Ysleta (El Paso County) Texas
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Bruner Corp., Milwaukee, Wis.
Cochrane Corp., Philadelphia, Pa.
Commercial Filters Corp., Melrose, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Cuno Engineering Corp., Meriden, Conn.
Dearborn Chemical Co., Chicago, Ill.
Dollinger Corp., Rochester, N. Y.
Duriron Co., Inc., The, Dayton, O.
Duro Co., Dayton, O.
Eddington Metal Specialty Co., Eddington, Pa.
Elgin Softener Corp., Elgin, Ill.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Fram Corp., Providence, R. I.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Greer Hydraulics, Inc., Jamaica, N. Y.
Henry Valve Co., Melrose Park, Ill.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford, Ill.
Industrial Filter & Pump Co., Chicago, Ill.
Kaye & MacDonald, Inc., West Orange, N. J.
Layne & Bowler, Inc., Memphis, Tenn.
Marvel Engineering Co., Chicago, Ill.
McIntire Co., The, Livingston, N. J.
Micro Metallic Corp., Glen Cove, N. Y.
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Norwood Associated Engineers Inc., Springfield, Mass.
Oshkosh Filter & Softener Co., Oshkosh, Wis.
Permutit Co., New York, N. Y.
Porous Plastic Filter Co., Glen Cove, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Red Jacket Mfg. Co., Davenport, Ia.
Reynolds Shaffer Co., Detroit, Mich.
Richmond Engineering Co., Richmond, Va.
Selas Corp. of America, Dresher, Pa.
Smith Chemical Co., E. W., La Puente, Calif.
Sparkler Mfg. Co., Mundelein, Ill.
Stover Water Softener Co., St. Charles, Ill.
Tryco Products, Inc., Westfield, Mass.
Uniflow Mfg. Co., Erie, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Winslow Engineering & Mfg. Co., Oakland, Calif.
Worthington Corp., Harrison, N. J.

FINNED TUBING

See Tubing, Finned

FIRE DAMPERS

See Dampers, Fire

FIRE EXTINGUISHING SYSTEMS

See Systems, Fire Extinguishing

FIRE PUMPS

See Pumps, Fire

FIRE VALVES AND VENTILATORS

See Ventilators, Roof, with Fusible Links

FITTINGS, ALUMINUM TUBE

Aircraft Fitting Co., Cleveland, O.
Crawford Fitting Co., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Parker Appliance Co., Cleveland, O.
Roylyn, Inc., Glendale, Calif.

FITTINGS, BLOW PIPE

Allington & Curtis Mfg. Co., Saginaw, Mich.
American Blow Pipe Co., Chicago, Ill. (tapers, tees, elbows, etc.)
Carolina Blower Co., Inc., Greensboro, N. C.
Chicago Metal Mfg. Co., Chicago, Ill.
Day Co., The, Minneapolis, Minn.
Goethel Sheet Metal Works, Inc., Alfred, Milwaukee, Wis.
Griffin & Co., Louisville, Ky.
Kice Metal Products Co., Wichita, Kans.
Kirk & Blum Mfg. Co., Cincinnati, O.
Newcomb-Detroit Co., Detroit, Mich.
Peters-Dalton, Inc., Detroit, Mich.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Research Vacuum Supply Co., Chicago, Ill.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Schmieg Industries, Inc., Detroit, Mich.
Torit Mfg. Co., St. Paul, Minn.
United Sheet Metal Co., Inc., Columbus, O.
United States Register Co., Battle Creek, Mich.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.
Young & Bertke Co., Cincinnati, O.

FITTINGS AND BUSHINGS, FUEL OIL TANK; ALARMS, LIQUID LEVEL

Barclay, Inc., Robert, Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
OPW Corp., Cincinnati, O.
Oil Equipment Mfg. Corp., New Haven, Conn.
Span Brass Mfg. Co., Otsego, Mich.
U. S. Plug & Fitting Co., Wellington, O.
Ward Foundries, Inc., J. P., Blossburgh, Pa.

FITTINGS FOR CENTRAL VACUUM CLEANING SYSTEMS

H-P Products, Inc., Louisville, O.
Pullman Vacuum Cleaner Co., Boston, Mass.
Spencer Turbine Co., Hartford, Conn.

FITTINGS, COPPER TUBE, COMPRESSION

Acheson Mfg. Co., Rankin, Pa.
Aircraft Fittings Co., Cleveland, O.
American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Baker & Co., R. H., Huntington Park, Calif.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Forging and Mfg. Co., Chicago, Ill.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Lunkenheimer Co., Cincinnati, O.
Madden Brass Products Co., Aurora, Ill.

Mueller Brass Co., Port Huron, Mich.
Parker Appliance Co., The, Cleveland, O.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Span Brass Mfg. Co., Otsego, Mich.
Wabash Corp., Chicago, Ill.
Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, COPPER TUBE, FLARED

Acheson Mfg. Co., Rankin, Pa.
Aircraft Fitting Co., Cleveland, O.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Gardiner Metal Co., Chicago, Ill.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Madden Brass Products Co., Aurora, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Parker Appliance Co., The, Cleveland, O.
Phoenix Brass Fittings Corp., Irvington, N. J.
Remco, Inc., Zelienople, Pa.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Span Brass Mfg. Co., Otsego, Mich.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Wabash Corp., Chicago, Ill.
Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, COPPER TUBE, SOLDER

Acheson Mfg. Co., Rankin, Pa.
American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Gardiner Metal Co., Chicago, Ill.
General Fittings Co., East Greenwich, R. I.
Gerry Tool Co., The, Bristol, Conn.
Grabler Mfg. Co., Cleveland, O.
Hammond Brass Works, Hammond, Ind.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Span Brass Mfg. Co., Otsego, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co., New York, N. Y. (silver brazed)

FITTINGS, DRAINAGE, FIXED AIR BREAK

Beaton & Cadwell Mfg. Co., New Britain, Conn.
Crane Co., Chicago, Ill.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.

FITTINGS, EXHAUST, GARAGE, FOR ATTACHING CAR EXHAUST PIPE

American Metal Hose Div., The American Brass Co., Waterbury, Conn.
Ammerman Co., Inc., Minneapolis, Minn.
Kent-Moore Organization, Inc., Warren, Mich.
Wendt Co., O. A., Chicago, Ill.

FITTINGS, HOSE TO PIPE

Acheson Mfg. Co., Rankin, Pa.
Aeroquip Corp., Jackson, Mich.
Allen Mfg. Co., W. D., Chicago, Ill.
American Sanitary Mfg. Co., Abingdon, Ill. (for polyethylene plastic tubing)
Anchor Coupling Co., Libertyville, Ill.
Binks Mfg. Co., Chicago, Ill.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dole Refrigerating Co., Chicago, Ill.
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
Hewitt-Robins, Inc., Stamford, Conn.
Jaco Mfg. Co., Cleveland, O. (nylon compression tube fitting)
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
LE-HI Div., Hose Accessories Co., Philadelphia, Pa.
Parker Appliance Co., Cleveland, O.
Quick Joint Div., Automatic Bending Co., Harvey, Ill. (for polyethylene plastic tubing)
Roylyn, Inc., Glendale, Calif.
Span Brass Mfg. Co., Otsego, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
United States Rubber Co., New York, N. Y.
Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, HOT WATER HEATING SYSTEMS, ONE PIPE

American Tube Products, Inc., Natick, R. I.
Autostributor Co., Lansing, Mich. (manifold for connecting radiator branches)
Bell & Gossett Co., Morton Grove, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Hi-Flow Products, Inc., Copiague, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kehm Corp., The, Chicago, Ill.
Mel Products Co., The, New Haven, Conn.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Span Brass Mfg. Co., Otsego, Mich.
Sullivan Valve & Engineering Co., Butte, Mont.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.

FITTINGS, LIFT

Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

FITTINGS, LINED

American Hard Rubber Co., New York, N. Y. (Rubber)
Bart Mfg. Corp., Belleville, N. J.
Cement Lined Pipe Co., Lynn, Mass. (Lead and tin)
Chemical Coatings & Engineering Co., Edgemont, Pa.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Gates Engineering Co., Wilmington, Del.
General Ceramics Corp., Keasbey, N. J. (ceramics & graphite)
Goodrich Co., B. F., Akron, O. (Rubber)
Goodrich Industrial Products Co., B. F., Akron, O.
Heil Process Equipment Corp., Cleveland, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin)
Luzerne Rubber Co., Trenton, N. J. (hard rubber)
Marquette Coppersmithing Co., Philadelphia, Pa.
Michigan Pipe Co., Gagetown, Mich. (Wood, saran rubber)
National Lead Co., New York, N. Y. (Lead)
Northern Indiana Brass Co., Elkhart, Ind. (Tinned)
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (lead)
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
United States Rubber Co., New York, N. Y. (Rubber)
Warren Foundry & Pipe Corp., New York, N. Y. (cement)

FITTINGS, PIPE, ALUMINUM

Aircraft Fitting Co., Cleveland, O.
Aluminum Co. of America, Pittsburgh, Pa.
American Flow Control Corp., Houston, Tex.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Ladish Co., Cudahy, Wis.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Robinson Corp., Somerville, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky. (welding)
Victaulic Co. of America, Elizabeth, N. J.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, BRASS, THREADED

Acheson Mfg. Co., Rankin, Pa.
Aeroquip, Inc., Van Wert, O.
Aircraft Fitting Co., Cleveland, O.
American Manganese Bronze Co., Philadelphia, Pa.
American Sanitary Mfg. Co., Abingdon, Ill.
Anchor Coupling Co., Libertyville, Ill.
Anderson Metals Corp., Kansas City, Mo.
Baker & Co., R. H., Huntington Park, Calif.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Flodar Corp., Cleveland, O.
Gilbert Brass Foundry Co., St. Louis, Mo.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Imperial Brass Mfg. Co., Chicago, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Ken-Ray Brass Corp., Vermont, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Leavitt Machine Co., Orange, Mass.
Madden Brass Products Co., Aurora, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Brass Co., Port Huron, Mich.
New York Brass Fdry., New York, N. Y.
Parker Appliance Co., Cleveland, O.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Span Brass Mfg. Co., Otsego, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co.. New York, N. Y. (Brazed)
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, PIPE, BRASS, WELDING

Chase Brass & Copper Co., Waterbury, Conn.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Robinson Corp., Somerville, N. J.
Span Brass Mfg. Co., Otsego, Mich.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.

FITTINGS, PIPE, BRONZE, BRAZED

Acheson Mfg. Co., Rankin, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, BRONZE, SOLDER

Acheson Mfg. Co., Rankin, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
General Fittings Co., East Greenwich, R. I.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Hi-Flow Products, Inc., Copiague, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.

Phoenix Brass Fittings Corp., Irvington, N. J.
Union Malleable Mfg. Co., Ashland, O.
Union Metal Works Co., Inc., Chelsea, Mass.

FITTINGS, PIPE, CAST IRON, FLANGED

Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Duriron Co., Inc., The, Dayton, O. (Acid resisting)
Frick Co., Waynesboro, Pa.
Goodall Rubber Co., Trenton, N. J.
Grinnell Co., Inc., Providence, R. I.
Kuhns Bros. Co., Dayton, O.
Leavitt Machine Co., Orange, Mass.
Lynchburg Foundry Co., Lynchburg, Va.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
Malleable Iron Fittings Co., Branford, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Parks-Cramer Co., Fitchburg Mass. (Jacketed)
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Warren Foundry & Pipe Corp., New York.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

FITTINGS, PIPE, CAST IRON, THREADED

Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Frick Co., Waynesboro, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Kuhns Bros. Co., Dayton, O.
Leavitt Machine Co., Orange, Mass.
Malleable Iron Fittings Co., Branford, Conn.
Ravena Iron Co., Ravena, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Plug & Fitting Co., Wellington, O. (pipe plug)
Union Malleable Mfg. Co., Ashland, O.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Zurn Mfg. Div., J. A., Zurn Industries, Inc., Erie, Pa.

FITTINGS, PIPE, COMPRESSION

Aircraft Fitting Co., Cleveland, O.
Baker & Co., R. H., Huntington Park, Calif.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Hays Mfg. Co., Erie, Pa.
Quick Joint Div., Automatic Bending Co., Harvey, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

FITTINGS, PIPE, HARD RUBBER

American Flow Control Corp., Houston, Tex.
American Hard Rubber Co., New York, N. Y.
Gates Engineering Co., Wilmington, Del.
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O.
Luzerne Rubber Co, Trenton, N. J.
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.

FITTINGS, PIPE, JACKETED

Albert Pipe Supply Co., Brooklyn, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, LEAD

Alpha Metals, Inc., Jersey City, N. J.
Anchor Metal Co., Inc., Brooklyn, N. Y.
Bunker Hill Co., The, Sales & Fabrication Div., Seattle, Wash.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Heil Process Equipment Corp., Cleveland, O.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Leavitt Machine Co., Orange, Mass.
National Lead Co., New York, N. Y.
Resisto Pipe & Valve Co., East Cambridge, Mass.
Rochester Lead Works, Inc., Rochester, N. Y.

FITTINGS, PIPE, MALLEABLE

Corley Co., Inc., The, New York, N. Y.
Crane Co., Chicago, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Fairbanks Co., The, New York, N. Y.
Fanner Mfg. Co., The, Cleveland, O.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Malleable Iron Fittings Co., Branford, Conn.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Rhode Island Fittings Co., Providence, R. I.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Union Malleable Mfg. Co., Ashland, O.
Union Pipe Fitting Co., Fort Atkinson, Wis.
Vitaulic Co. of America, Elizabeth, N. J.
Walworth Co., New York, N. Y.
Ward Foundries, Inc. J. P., Blossburgh, Pa.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

FITTINGS, PIPE, MALLEABLE, BRAZED

Flagg & Co., Inc., Stanley G., Philadelphia, Pa.

FITTINGS, PIPE, NICKEL AND NICKEL ALLOY

American Manganese Bronze Co., Philadelphia, Pa.
Bart Mfg. Corp., Belleville, N. J.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
International Nickel Co., Inc., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Robinson Corp., Somerville, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky. (welding)
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, NICKEL PLATED

Acheson Mfg. Co., Rankin, Pa.
Bart Mfg. Corp., Belleville, N. J.
Quick Joint Div., Automatic Bending Co., Harvey, Ill.
Taylor Forge & Pipe Wks., Chicago, Ill.

FITTINGS, PIPE, PLASTIC

Albert Pipe Supply Co., Brooklyn, N. Y.
Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Agile Corp., Bedford, O.
American Flow Control Corp., Houston, Tex.
American Hard Rubber Co., New York, N. Y.
Anesite Co., Skokie, Ill.
Associated Plastic Co's., Inc., Midland, Mich. (rigid polyvinyl)
Atlas Mineral Products Co., Mertztown, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Carlon Products Corp., Cleveland, O.
Chesflex Corp., Yonkers, N. Y.
Clover Industries, Inc., Tonawanda, N. Y. (thread protectors)
Colonial Plastics Mfg. Co., Cleveland, O.
Commercial Plastics Co., Chicago, Ill.
Continental Can Co., Millsplastic Pipe Div., New York, N. Y.
Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind.
Easton Plastic Products Co., Inc., Easton, Pa. (rigid unplasticized polyvinyl chloride)
General Ceramics Corp., Keasbey, N.J.
Franklin Plastics, Inc., Franklin, Pa.
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Plastics Products, Marietta, O. (PVC)
Grinnell Co., Inc., Providence, R. I.
Hartwell & Son, Inc., H. N., Boston, Mass. (PVC)
Haveg Industries, Inc., Newark, Del.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Industrial Plastic Fittings Co., Cleveland, O.
Jaco Mfg. Co., Cleveland, O. (nylon compression tube fitting)
Johnson Plastics Corp., Chagrin Falls, O.
Luzerne Rubber Co., Trenton, N. J.
Manufacturers Corp., Mansfield, O.
Moore & Co., Samuel, Mantua, O. (tubing)
Mueller Brass Co., Port Huron, Mich.
Nelson Foundry Co., Morton Grove, Ill.
Plastex Corp., Columbus, O.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Protective Closures Co., Inc., Buffalo, N. Y. (cap and plug closures)
Protokap, Inc., Houston, Tex. (end caps)
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Reflin Co., San Diego, Calif. (rigid, reinforced with glass fibers)
Republic Steel Corp., Cleveland, O.
Richland Co., Mansfield, O.
Robinson Clay Product Co., The, Akron, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
S & C Mfg. Co., Cincinnati, O.
Saran Lined Pipe Co., Ferndale, Mich. (saran)
Seelye Craftsman, Minneapolis, Minn.
Skyline Industries, Titusville, Pa.
Southwestern Plastic Pipe Co., Mineral Wells, Tex.
Stokes Molded Products, Div. of The Electric Storage Battery Co., Trenton, N. J. (unplasticized polyvinyl chloride)
Texas Vitrified Pipe Co., Mineral Wells, Tex.
Tube Turns Plastics, Inc., Louisville, Ky. (injection molded PVC, and others)
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.
Walworth Co., New York, N. Y.
Yardley Plastics Co., Columbus, O.

FITTINGS, PIPE, SADDLE TEE

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Baker & Co., R. H., Huntington Park, Calif.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Ladish Co., Cudahy, Wis.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Skinner Co., M. B., South Bend, Ind.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky. (welding)

FITTINGS, PIPE, SANITARY

Acheson Mfg. Co., Rankin, Pa.
Central Foundry Co., Newark, N. J.
Duriron Co., Inc., The, Dayton, O. (corrosion resisting)
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Leavitt Machine Co., Orange, Mass.
Mueller Brass Co., Port Huron, Mich.
Robinson Clay Product Co., The, Akron, O.
Somerville Iron Works, Inc., Chattanooga, Tenn.

Stockham Valves & Fittings, Birmingham, Ala.
Union Malleable Mfg. Co., Ashland, O.
Union Metal Works Co., Inc., Chelsea, Mass.

FITTINGS, PIPE, SPECIAL FOR BASEBOARD RADIATION

General Fittings Co., East Greenwich, R. I.
Hi-Flow Products, Inc., Copiague, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Rittling Corp., The, Buffalo, N. Y.
Union Metal Works Co., Inc., Chelsea, Mass.
Webster & Co., Warren, Camden, N. J.

FITTINGS, PIPE, STAINLESS STEEL

Aircraft Fitting Co., Cleveland, O.
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Alloy Stainless Products Co., Totowa, N. J.
American Flow Control Corp., Houston, Tex.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Baker & Co., R. H., Huntington Park, Calif.
Camco Products Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Fabri-Valve Co. of America, Portland, Ore.
Flodar Corp., Cleveland, O.
Hasco Valve & Machine Co., Milwaukee, Wis.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Portland Copper and Tank Works, Inc., South Portland, Me.
Pypon Co., Pittsburgh, Pa.
Robinson Corp., Somerville, N. J.
Speedline Stainless Steel Fittings Div., Horace T. Potts Co., Philadelphia, Pa.
Stainless Welded Products, Inc., Clifton, N. J.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, STAINLESS STEEL, WELDING

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products, Inc., North Haven, Conn.
Clyde Tube Forgings of America, Inc., Portland, Ore.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Fabri-Valve Co. of America, Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Heat & Power Corp., Baltimore, Md.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Portland Copper and Tank Works, Inc., South Portland, Me.
Pypon Co., Pittsburgh, Pa.
Robinson Corp., Somerville, N. J.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Stainless Welded Products, Inc., Clifton, N. J.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, STEEL, FLANGED

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Crane Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Pipe Line Development Co., Cleveland, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Semet-Solvay Engrg Div., Allied Chemical & Dye Corp., New York, N. Y.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, STEEL, FORGED, THREADED

Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Meter Co., Inc., Philadelphia, Pa.
Bonney Forge & Tool Works, Allentown, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Henry Valve Co., Melrose Park, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Larkin Packer Co., Inc., Waxahachie, Tex.
Parker Appliance Co., Cleveland, O.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif. (pipe plug)
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, STEEL, SOCKET WELD

Alpha Plastics, Inc., Livingston, N. J. (PVC)
Bonney Forge & Tool Works, Allentown, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Ladish Co., Cudahy, Wis.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, STEEL, THREADED

Bonney Forge & Tool Works, Allentown, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Flodar Corp., Cleveland, O.
Frick Co., Waynesboro, Pa.
Harrisburg Steel Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Ladish Co., Cudahy, Wis.
Larkin Packer Co., Inc., Waxahachie, Tex.
Parker Appliance Co., The, Cleveland, O.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Tubing Seal-Cap, Inc., San Gabriel, Calif. (plugs and caps)
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, STEEL, WELDING

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Beaird Co., J. B., Shreveport, La.
Bonney Forge & Tool Works, Allentown, Pa.
Crane Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Heat & Power Corp., Baltimore, Md.
Ladish Co., Cudahy, Wis.
Larkin Packer Co., Inc., Waxahachie, Tex.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pipe Line Development Co., Cleveland, O.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Walworth Co., New York, N. Y.
Youngstown Welding & Engineering Co., Youngstown, O.

FITTINGS, PIPE, STEEL, WELDING, SEAMLESS

Babcock & Wilcox., Tubular Products Div., Beaver Falls, Pa.
Bart Mfg. Corp., Belleville, N. J. (nickel coated)
Clyde Tube Forgings of America, Inc., Portland, Ore.
Crane Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Larkin Packer Co., Inc., Waxahachie, Tex.
Northern Indiana Brass Co., Elkhart, Ind.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Special Screw Products, Bedford, O.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, WROUGHT IRON, WELDING

Albert Pipe Supply Co., Brooklyn, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bonney Forge & Tool Works, Allentown, Pa.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.

FITTINGS, REFRIGERATION

Aero-Coupling Corp., Burbank, Calif.
Aeroquip, Inc., Van Wert, O.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Forging and Mfg. Co., Chicago, Ill.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Madden Brass Products Co., Aurora, Ill.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Remco, Inc., Zelienople, Pa.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Span Brass Mfg. Co., Otsego, Mich.

Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Wabash Corp., Chicago, Ill.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Wittenmeier Machinery Co., Chicago, Ill.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

FITTINGS, STEEL TUBE, FLARED

Aeroquip, Inc., Van Wert, O.
Aircraft Fitting Co., Cleveland, O.
Couplings Co., Chicago, Ill.
Flodar Corp., Cleveland, O.
H-P Products, Inc., Louisville, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Roylyn, Inc., Glendale, Calif.
Special Screw Products, Bedford, O.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.

FITTINGS, STEEL TUBE, FLARELESS

Aircraft Fitting Co., Cleveland, O.
American Flow Control Corp., Houston, Tex.
Chicago Forging and Mfg. Co., Chicago, Ill.
Crawford Fitting Co., Cleveland, O.
Flodar Corp., Cleveland, O.
H-P Products, Inc., Louisville, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Lenz Co., Dayton 1, O.
Parker Appliance Co., The, Cleveland, O.
Roylyn, Inc., Glendale, Calif.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Youngstown Welding & Engineering Co., Youngstown, O.

FLAME CONTROLS

See Controls, Flame Failure

FLAME CUTTERS

See Cutters, Flame

FLANGE BOLTS

See Bolts and Studs, Flange

FLANGE SEPARATORS

See Separators, Flange

FLANGES, ORIFICE

American Meter Co., Inc., Philadelphia, Pa.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Bryant Industrial Products Corp., Cleveland, O
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Ladish Co., Cudahy, Wis.
Madden Corp., The, Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
New York Brass Foundry, New York, N. Y. (brass)
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Trimount Instrument Co., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, ALLOY STEEL, LAP JOINT

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, ALLOY STEEL, SCREWED

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Beaird Co., J. B., Shreveport, La.
Camco Products Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, ALLOY STEEL, WELDING

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, ALUMINUM, WELDING

Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, BRASS, SCREWED

Acheson Mfg. Co., Rankin, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Providence, R. I.
Ladish Co., Cudahy, Wis.
National Valve & Mfg. Co., Pittsburgh, Pa.
New York Brass Foundry, New York, N. Y.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Ritter Pattern & Casting Co., New York, N. Y.
Span Brass Mfg. Co., Otsego, Mich.
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co., New York, N. Y.

FLANGES, PIPE, CAST IRON, SCREWED

Bryant Industrial Products Corp., Cleveland, O.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Frick Co., Waynesboro, Pa.
G. & H Mfg. Co., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Kuhns Bros. Co., Dayton, O.
Lynchburg Foundry Co., Lynchburg, Va.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Ravena Iron Co., Ravena, N. Y.
Ritter Pattern & Casting Co., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Warren Foundry & Pipe Corp., New York, N. Y.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

FLANGES, PIPE, MALLEABLE IRON, SCREWED

Beaton & Corbin Mfg. Co., Southington, Conn.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Jefferson Union Co., New York, N. Y.
National Valve & Mfg. Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

FLANGES, PIPE, NICKEL AND NICKEL ALLOY

Bart Mfg. Corp., Belleville, N. J.
Camco Products, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Hasco Valve & Machine Co., Milwaukee, Wis.
International Nickel Co., Inc., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, STEEL, FORGED

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products, Inc., North Haven, Conn.
Clyde Tube Forgings Co. of America, Inc., Portland, Ore.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.

Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, STEEL, LAP JOINT

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Welding Fitting Corp., New Castle, Pa.

FLANGES, PIPE, STEEL, SCREWED

Beaird Co., J. B., Shreveport, La.
Camco Products, Inc., North Haven, Conn.
Clyde Tube Forgings Co. of America, Inc., Portland, Ore.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Plug & Fitting Co., Wellington, O.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, STEEL, WELDING

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Camco Products, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Pennsylvania Forge Co., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Pipe Line Development Co., Cleveland, O.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Roessing Mfg. Co., Pittsburgh, Pa.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FLARED FITTINGS, COPPER TUBE

See Fittings, Copper, Tube, Flared

FLARED FITTINGS, STEEL TUBE

See Fittings, Steel Tube, Flared

FLARING TOOLS FOR TUBING

See Tools, Flaring

FLEXIBLE COUPLINGS

See Couplings, Flexible

FLEXIBLE DUCT CONNECTIONS

See Connections, Duct, Flexible

FLEXIBLE METAL HOSE

See Hose, Flexible, Metal and Fittings

FLOAT SWITCHES

See Switches, Float

FLOAT VALVES

See Valves, Float

FLOATS, STEAM TRAP, ETC.

Armstrong Machine Wks., Three Rivers, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Chicago Float Works, Not Inc., Chicago, Ill.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.
Crane Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Harris & Co., Arthur, Chicago, Ill. (all metals)
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kieley & Mueller, Inc., Middletown, N. Y.
McAlear Mfg. Co., Chicago, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Owens & Co., Inc., Henry, Cranston, R. I.
Reichert Float & Mfg. Co., Toledo, O.
Sarco Co., Inc., New York, N. Y.
Sterling Engineering Mfg. Corp., Hyde Park, Mass.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Watson & McDaniel Co., Philadelphia, Pa.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

FLOOR AND CEILING PLATES

See Plates, Floor and Ceiling

FLOW ALARMS

See Alarms, High and Low Flow for Piping Systems

FLOW CONTROL VALVES

See Valves, Flow Control

FLOW MEASURING NOZZLES AND TUBES

See Nozzles, Flow Measuring

FLOW METERS

See Meters, Flow

FLOW SWITCHES

See Switches, Flow

FORGED STEEL VALVES

See Valves, Forged Steel

FRAMES, AIR INLET, PREFABRICATED, FOR AIR CONDITIONING UNITS

Lewis Mfg. Co., Inc., Miami, Fla.

FRESHENERS, AIR

See Adsorbers, Odor; Compounds, Air Freshening

FUEL ECONOMIZERS

See Economizers, Fuel

FUEL OIL LEAK DETECTORS

See Detectors, Leak, Fuel Oil

FUEL OIL UNITS

See Units, Fuel Oil

FUEL UNIT TESTERS

See Testers, Fuel Unit

FURNACES, DUCT

See Heaters, Duct

FURNACES, SUSPENDED

See Heaters, Air, Direct Fired

FURNACES, WARM AIR, FOR INDUSTRIAL AND LARGE BUILDING CENTRAL HEATING

(Exclusively for duct distribution of air—300,000 Btu per hr and over) For direct fired heaters, which may be located in the space heated or may be used in central plant installations with duct distribution of the air, see the listings under Heaters, Air, Direct Fired.

Air Conditioning Engineering Co., Cambridge, Mass.
Aladdin Heating Corp., San Leandro, Calif.
American Foundry & Furnace Co., Bloomington, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Armstrong Furnace Co., Div. of Union Electric Corp., Columbus, O.
Auburn Foundry, Inc., Heating Div., Auburn, Ind.
Bard Mfg. Co., Bryan, O.
Besser Metal Products, Corp., Charlotte, N. C.
Bonair Products, Inc., Darby, Pa.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Gilbert & Barker Mfg. Co., West Spring, Mass.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Inland Heater Corp., Minneapolis, Minn.
International Heater Co., Utica, N. Y.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Johnson Heater Corp., Chelsea, Mass.
Lee Corporation, Wilmington, Del.
Lennox Industries, Inc., Columbus, O.
Lennox Industries, Inc., Marshalltown, Ia.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., Minneapolis, Minn.
McPherson Furnace & Supply Co., Portland, Ore.
Meyer Furnace Co., The, Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
National Heater Co., St. Paul, Minn.
National-U. S. Radiator Corp., Johnstown, Pa.
Norwalk Air Conditioning Corp., S. Norwalk, Conn.
Olson & Co., Arthur A., Canfield, O.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Ray Oil Burner Co., San Francisco, Calif.
Rosebraugh Co., W. W., Salem, Ore.
Round Oak Co., Inc., Dowagiac, Mich.
Stewart-Warner Corp., U.S. Machine Div., Lebanon, Ind.
Surface Combustion Corp., Toledo, O.
Syncromatic Corp., Watertown, Wis.
Tjernlund Mfg. Co., St. Paul, Minn.
Tuck-Aire Furnace Co., San Francisco, Calif.
Waterman-Waterbury Co., The, Minneapolis, Minn.

FUSIBLE LINKS

See Links, Fusible

GAGE GLASSES

See Glasses, Gage

GAGE SETS, REFRIGERATION

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.

GAGE TESTERS

See Testers, Gage, Dead Weight

GAGES, AIR FILTER

Bacharach Industrial Instrument Co., Pittsburgh, Pa. (filter gauge)
Cleveland Fuel Equipment Co., Cleveland, O.
Defender Instrument and Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Hays Corp., Michigan City, Ind.
Herbusch Corp., The, St. Louis, Mo. (Warning device)
Meriam Instrument Co., The, Cleveland, O.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.

GAGES, INDICATING, DRAFT

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Canton Stoker Corp., Canton, O.
Cleveland Fuel Equipment Co., Cleveland, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Defender Instrument and Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Hill & Co., E. Vernon, Lake Geneva, Wis.
King Engineering Corp., Ann Arbor, Mich.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.

GAGES, INDICATING, PRESSURE

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Acragage Corp., Milford, Conn.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
Bristol Co., The, Waterbury, Conn.
Bryant Industrial Products Corp., Cleveland, O.
Canton Stoker Corp., Canton, O.
Cleveland Fuel Equipment Co., Cleveland, O.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Defender Instrument and Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Dillon & Co., Inc., W. C., Van Nuys, Calif. (mechanical)
Dunham-Bush, Inc., West Hartford, Conn.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport, Conn.
Imperial Brass Mfg. Co., Chicago, Ill.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Longergan Co., J. E., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
New York Air Valve Corp., Brooklyn, N. Y.
Norwalk Valve Co., South Norwalk, Conn.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Wallace & Tiernan Inc., Belleville, N. J.

GAGES, INDICATING, VACUUM

Acragage Corp., Milford, Conn.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Cleveland Fuel Equipment Co., Cleveland, O.
Crosby Steam Gage Valve Co., Wrentham, Mass.
Defender Instrument and Regulator Co., Boody, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Dickson Co., The, Chicago, Ill.
Dole Valve Co., The, Morton Grove, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hastings-Raydist, Inc., Hampton, Va.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport, Conn.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Imperial Brass Mfg. Co., Chicago, Ill.
Longergan Co., J. E., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
New York Air Valve Corp., Brooklyn, N. Y.
Norwalk Valve Co., South Norwalk, Conn.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Research Vacuum Supply Co., Chicago, Ill.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Wallace & Tiernan Inc., Belleville, N. J.

GAGES, LIQUID LEVEL

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Boston Auto Gage Co., Pittsfield, Mass.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Defender Instrument and Regulator Co., Boody, Ill.
Diamond Power Specialty Corp., Lancaster, O.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Frick Co., Waynesboro, Pa.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Henry Valve Co., Melrose Park, Ill.
Keckley Co., O. C., Skokie, Ill.
King Engineering Corp., Ann Arbor, Mich.
Krueger Sentry Gauge Co., Green Bay, Wis.
Liquidometer Corp., Long Island City, N. Y.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Nason Co., Clarkston, Mich.
New York Air Valve Corp., Brooklyn, N. Y.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Petrometer Corp., Long Island City, N. Y.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Powell Co., Wm., Cincinnati, O.
Reliance Gauge Column Co., Cleveland, O.
Republic Mfg. Co., Cleveland, O.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Simplex Valve & Meter Co., Philadelphia, Pa.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Strahman Valves, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Swift Lubricator Co., Elmira, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Wallace & Tiernan Inc., Belleville, N. J.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (water)
Yarnall-Waring Co., Philadelphia, Pa.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

GAGES, OIL TANK

Applied Mechanics Co., Boston, Mass.
Boston Auto Gage Co., Pittsfield, Mass.
Boston Machine Works Co., Lynn, Mass.
Defender Instrument & Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
King Engineering Corp., Ann Arbor, Mich.
Krueger Sentry Gauge Co., Green Bay, Wis.
Liquidometer Corp., Long Island City, N. Y.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Morse-Smith-Morse, Inc., Watertown, Mass.
Oil Equipment Mfg. Corp., New Haven, Conn.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Petrometer Corp., Long Island City, N. Y.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scully Signal Co., Melrose, Mass.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Viking Pump Co., Cedar Falls, Ia.

GAGES, PIPE

A.C.M.I. Borescope Div., American Cystoscope Makers, Inc., New York, N. Y. (internal borescope)
Dayton Rogers Mfg. Co., Minneapolis, Minn.
Defender Instrument & Regulator Co., Boody, Ill.
Greenfield Tap & Die Corp., Greenfield, Mass.
Threadwell Tap & Die Co., Greenfield, Mass.
Three Point Industries, Evanston, Ill.

GALVANIZED SHEETS

See Sheets, Steel, Galvanized

GALVANNEALED SHEETS

See Sheets, Steel, Galvannealed

GARAGE VENTILATION FITTINGS

See Fittings, Exhaust, Garage, for Attaching Car Exhaust Pipe

GAS BURNERS

See Burners, Gas

GAS ENGINES
See Engines, Gas

GAS FIRED RADIATORS
See Radiators, Gas Fired

GAS PRESSURE REGULATORS
See Regulators, Pressure, Gas

GAS VENT AND FLUE PIPE
See Pipe and Fittings, Gas Vent and Flue

GAS VOLUME METERS
See Meters, Volume, Air and Gas

GASKETS
Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Akron Metallic Gasket Co., Akron, O.
Alpha Metals, Inc., Jersey City, N. J.
American Felt Co., Glenville, Conn.
Anchor Packing Co., Philadelphia, Pa. (Asbestos)
Armstrong Cork Co., Lancaster, Pa. (Cork & cork composition)
Belmont Packing & Rubber Co., Philadelphia, Pa.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y. (Lead)
Brady Co., W. H., Milwaukee, Wis.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chase Brass & Copper Co., Waterbury, Conn. (Brass and copper)
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Chicago-Wilcox Mfg. Co., Chicago, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Continental-Diamond Div. of The Budd Co. Inc., Newark, Del.
Continental Rubber Wks., Erie, Pa.
Crane Co., Chicago, Ill.
Crane Packing Co., Morton Grove, Ill.
Darcoid Co., Inc., New York, N. Y. (Asbestos)
Durabla Mfg. Co., New York, N. Y. (Asbestos fibre)
Ernst Water Column & Gauge Co., Livingston, N. J.
Excelsior Leather Washer Mfg. Co., Rockford, Ill. (leather)
Federated Metal Div., American Smelting & Refining Co., New York, N. Y.
Felt Products Mfg. Co., Chicago, Ill.
Felters Company, The, Boston, Mass.
Flexitallic Gasket Co., Camden, N. J. (Metal, asbestos)
Flexlock Corp., Kent, O.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O. (rubber)
Goodyear Tire & Rubber Co., Akron, O.
Grant Wilson, Inc., Chicago, Ill. (asbestos)
Graton & Knight Co., Inc., Worcester, Mass. (Leather)
Greene, Tweed & Co., North Wales, Pa.
Hewitt-Robins, Inc., Stamford, Conn.
Houghton & Co., E. F., Philadelphia, Pa.
Johns-Manville, New York, N. Y.
Linear Incorporated, Philadelphia, Pa.
McCord Corp., Detroit, Mich.
Metallo Gasket Co., New Brunswick, N. J. (Metal, metal asbestos)
Mortell Co., J. W., Kankakee, Ill.
National Engineering Products, Inc., Washington, D. C. (Plastic)
National Lead Co., New York, N. Y. (lead)
Neff-Perkins Mfg. Co., Cleveland, O.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Parker Appliance Co., The, Cleveland, O.
Products Research Co., Los Angeles, Calif.
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber and asbestos)
Rhopac, Inc., Skokie, Ill. (all types — non metallic)
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O. (asbestos)
Saran Lined Pipe Co., Ferndale, Mich. (saran rubber)
Schieren Co., Chas. A., New York, N. Y.
Sponge Products Div., B. F. Goodrich Co., Shelton, Conn.
Spring Packing Corp., Chicago, Ill. (adhesive-backed sponge rubber, cork & felt)
Stalwart Rubber Co., The, Bedford, O. (rubber)
Stokes Molded Products, Div. of The Electric Storage Battery Co., Trenton, N. J. (Hard rubber)
Strahman Valves, Inc., New York, N. Y.
Technical Ply-Wood Sales, Chicago, Ill.
Thermoid Co., Trenton, N. J.
Tube Turns Plastics, Inc., Louisville, Ky. (for PVC pipe)
United States Gasket Co., Camden, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O. (plastic)
Western Felt Wks., Chicago, Ill. (Felt)
Wolfe Co., Inc., The, Franklin C., Culver City, Calif.
Zimmerman Packing Co., Cincinnati, O. (also gasket cutters)

GASOLINE FIRED HEATERS
See Heaters, Gasoline Fired

GAS VENT AND FLUE PIPE AND FITTINGS
See Pipe and Fittings, Gas Vent and Flue

GATES, BLAST
Allington & Curtis Mfg. Co., Saginaw, Mich.
Berger Bros., Co., Philadelphia, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Goethel Sheet Metal Works, Inc., Alfred, Milwaukee, Wis.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Kirk & Blum Mfg. Co., Cincinnati, O.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Rockwell Co., W. S., Fairfield, Conn.
Spencer Turbine Co., Hartford, Conn.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.

GATES, LIFT, FOR TRUCKS
Anthony Company, Streator, Ill.

GEAR-MOTORS
Abart Gear & Machine Co., Chicago, Ill.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Allis Co., Louis, The, Milwaukee, Wis.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Century Electric Co., St. Louis, Mo.
Cone-Drive Gears Div., Michigan Tool Co., Detroit, Mich.
Doerr Electric Corp., Cedarburg, Wis.
Electro-Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Elliott Co., Jeannette, Pa.
Falk Corp., Milwaukee, Wis.
Janette Elect. Mfg. Co., Morton Grove, Ill.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich. (hydraulic)
Lamb Electric Co., Kent, O.
Lima Electric Motor Co., The, Lima, O.
Link-Belt Co., Chicago, Ill.
Master Electric Co., Dayton, O.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Smith Corp., A. O., Milwaukee, Wis.
U.S. Electrical Motors, Inc., Los Angeles, Calif.

GENERATORS, STEAM, ELECTRIC (Electrically "Fired" Boilers)
Berry-Hill Corp., Hill Diesel Engine Div., Providence, R. I. (diesel)
Custom Engrg. Co., Los Angeles, Calif.
Hill Diesel Engine Corp., Lansing, Mich.
Orr & Sembower, Inc., Reading, Pa.

GLASS, HEAT ABSORBING
See Windows, Heat Insulating

GLASS PIPE
See Pipe, Glass

GLASSES, GAGE
Associated Valve & Engineering Co., Chicago, Ill.
Chesterton Co., A. W., Everett, Mass.
Chicago Specialty Mfg. Co., Chicago, Ill.
Corning Glass Works, Corning, N. Y.
Defender Instrument & Regulator Co., Boody, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Diamond Power Specialty Corp., Lancaster, O.
Ernst Water Column & Gauge Co., Livingston, N. J.
Henry Valve Co., Melrose Park, Ill.
Libbey-Owens-Ford Glass Co., Toledo, O.
Longergan Co., J. E., Philadelphia, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
OPW Corp., Cincinnati, O.
Penberty Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Scientific Instrument Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Strahman Valves, Inc., New York, N. Y.
Swift Lubricator Co., The, Elmira, N. Y.
Uehling Instrument Co., Paterson, N. J.
Vilter Mfg. Co., The, Milwaukee, Wis.

GLASSES, SIGHT, FOR PIPE LINES
Allin Mfg. Co., Chicago, Ill.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
Chesterton Co., A. W., Everett, Mass.
Cochrane Corp., Philadelphia, Pa.
Corning Glass Works, Corning, N. Y.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fischer & Porter Co., Hatboro, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Libbey-Owens-Ford Glass Co., Toledo, O.
McIntire Co., The, Livingston, N. J.
Mueller Brass Co., Port Huron, Mich.
Norwood Associated Engineers, Inc., Springfield, Mass.
OPW Corp., Cincinnati, O.
Penberty Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Remco, Inc., Zelienople, Pa. (for refrigerant lines)
Sarco Co., Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Swift Lubricator Co., The, Elmira, N. Y.

GLOBE VALVES
See Valves, Globe

GLYCOL VAPORIZERS
See Units, Sterilizing, Air

GOVERNORS, PUMP
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Burrows Mfg. Co., F. A., York, Pa.
Cash Co., A. W., Decatur, Ill.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Schade Valve Mfg. Co., Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Spence Engineering Co., Inc., Walden, N. Y.

Squires Co., C. E., Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Synchro-Start Products, Inc., Skokie, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Willams Gauge Co., Inc., The, Pittsburgh, Pa.

GRILLES

See also Diffusers, Panels Perforated, for Air Diffusion; Registers

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Factors, Inc., Monrovia, Calif.
Air-Path Products Co., Baltimore, Md. (stamped steel)
Alton Mfg. Co., Dallas, Tex.
American Warming & Ventilating Co., Toledo, O.
Auer Register Co., Cleveland, O.
Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Beckley Perforating Co., Garwood, N. J.
Carnes Corp., Verona, Wis.
Central Wire & Iron Works, Des Moines, Ia.
Char-Gale Mfg. Co., Minneapolis, Minn.
Controlair Mfg. Co., Los Angeles, Calif.
Diamond Mfg. Co., Wyoming, Pa.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Erdle Perforating Co., Rochester, N. Y.
General Register Corp., Cedar Grove, N. J.
Harrington & King Perforating Co., Inc., Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland, O.
Johnston & Chapman Co., Chicago, Ill.
Lima Register Co. The, Lima, O.
Louvra Mfg. & Sales Co., Union, N. J.
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
Midco Register Corp., St. Paul, Minn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mundt & Sons, Charles, Jersey City, N. J.
Palmer Mfg. Corp., Phoenix, Ariz.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Reliable Perforating Co., Chicago, Ill.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Standard Stamping & Perforating Co., Chicago, Ill.
Stewart Mfg. Co., Inc., Cedar Grove, N. J.
Thermotank, Inc., Products Div., Detroit, Mich.
Titus Mfg. Corp., Waterloo, Iowa.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Viking Mfg. Corp., Cleveland, O.
Waterloo Register Co., Inc., Waterloo, Ia.
Western Wire & Iron Works, Inc., Chicago, Ill. (metal)
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Young Regulator Co., Cleveland, O.

GRINDERS AND GRINDING WHEELS, WELD

Albertson & Co., Inc., Sioux City, Ia.
Baldor Electric Co., St. Louis, Mo.
Black & Decker Mfg. Co., The, Towson, Md.
Buckeye Tools Corp., Dayton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Cincinnati Electrical Tool Co., The, Cincinnati, O.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Franklin Balmar Corp., Baltimore, Md.
Mall Tool Co., Div. of Remington Arms Co., Inc., Chicago, Ill.
Milwaukee Electric Tool Corp., Milwaukee, Wis
Norton Co., Worcester, Mass.
Portable Electric Tools, Inc., Chicago, Ill.
Raybestos-Manhattan, Inc., Passaic, N. J.
Rotor Tool Co., Cleveland, O.
Skil Corp., Chicago, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago, Ill.
Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Stanley Works, The, New Britain, Conn.
Thor Power Tool Co., Aurora, Ill.
United States Electrical Tool Co., Cincinnati, O.

GUNS, POTS AND CANDLES, SMOKE AND SMUDGE, FOR TESTING AIR MOVEMENT

Hill & Co., E. Vernon, Lake Geneva, Wis.
Kilgore, Inc., Westerville, O.
Mine Safety Appliances Co., Pittsburgh, Pa.
Unexcelled Chemical Corp., New York, N. Y.

HAND SHEARS

See Shears and Snips, Hand

HANGERS OR BRACKETS, RADIATOR

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Arjac Products, Inc., Rochester, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Carty & Moore Engineering Co., Detroit, Mich.
Crawford Co., Chicago, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Gateway Engineering Co., Chicago, Ill.
Hartmann Co., Chas., Brooklyn, N. Y.
Healy Ruff Co., St. Paul, Minn.
Jennison Co., The, Fitchburg, Mass. (Adjustable radiator foot rest)
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Rittling Corp., The, Buffalo, N. Y.
Unistrut Products Co., Chicago, Ill.

HANGERS AND SUPPORTS, DUCT

Acme Mfg. Co., Philadelphia, Pa.
Adelta Mfg. Co., Inc., Philadelphia, Pa. (galvanized)
Bergen Pipesupport Corp., New York, N. Y. (variable spring & constant supports)
Corbman Bros., Inc., Philadelphia, Pa.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J. (vibration)
Hexdall Co., A. M., Morris, Ill. (duct and furnace round pipe, furnace, square)
Inland Steel Products Co., Milwaukee, Wis. (galvanized)
Omark Industries, Portland, Ore.
Moore Inc., Goodloe E., Danville, Ill.
Phillips Drill Co., Michigan City, Ind. (self-drilling expansion shells)
Redi-Bolt, Inc., East Chicago, Ind. (continuous threaded steel rod)
Remington Arms Co., Inc., Bridgeport, Conn. (stud, pin and threaded types)
Steel City Electric Co., Pittsburgh, Pa. (trapeze)
Unistrut Products Co., Chicago, Ill.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa. (cartridge stud driver)
Waverly Heating Supply Co., Boston, Mass.
Williamson Co., Cincinnati, O. (galvanized)

HANGERS AND SUPPORTS, PIPE

Air-Path Products Co., Baltimore, Md. (inserts)
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y. (cast)
American Tube Products, Inc., Natick, R. I. (copper tube)
Armart Mfg. Co., Pittsfield, Mass. (copper tube hangers & straps, wire pipe hooks, galv. pipe straps, and perforated hanger iron)
Basic Engineers Inc., Pittsburgh, Pa.
Bergen Pipesupport Corp., New York, N. Y. (variable spring, constant support and hanger assemblies)
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa. (spring and solid)
Carpenter & Paterson, Inc., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn. (copper strap)
Clayton & Lambert Mfg. Co., Louisville, Ky. (metal)
Commercial Plastics Co., Chicago, Ill. (plastic strap)
Crane Co., Chicago, Ill.
Crawford Co., Chicago, Ill.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Finn & Co., Inc., T.R., Hawthorne, N. J. (Rubber-in-shear & steel spring)
Frick Co., Waynesboro, Pa.
G & H Mfg. Co., Philadelphia, Pa. (hook)
Gateway Engineering Co., Chicago, Ill.
General Fittings Co., East Greenwich, R. I. (strap hangers)
Gerrard & Co., A. J., Melrose Park, Ill. (strap)
Globe Products, Huppower Div., Hupp Corp., Detroit, Mich.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Holub Industries, Inc., Sycamore, Ill. (steel and plastic)
Korfund Co., Inc., Long Island City, N. Y.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y. (spring hangers and roller hangers)
Midwest Piping Co., Inc., St. Louis, Mo.
Minerallac Electric Co., Chicago, Ill.
Modern Hanger Co., Cleveland, O.
Moore Inc., Goodloe E., Danville, Ill.
Mult-A-Frame Div., Ainsworth Mfg. Corp., Detroit, Mich.
National-U. S. Radiator Corp., Johnstown, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa. (counterpoise)
Northern Indiana Brass Co., Elkhart, Ind. (copper tube)
Omark Industries, Portland, Ore.
Paine Co., Addison, Ill. (snug fit wire pipe hooks; pipe straps; rings and bolts; perforated hanger iron)
Phillips Drill Co., Michigan City, Ind. (self-drilling expansion shells)
Piping Specialties, Inc., New York, N. Y. (anchor and guide for expansion joints; spring and all types)
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Cleveland, O. (conduit clips)
Ravena Iron Co., Ravena, N. Y. (hook plates)
Redi-Bolt, Inc., East Chicago, Ind. (continuous threaded steel rod)
Remington Arms Co., Inc., Bridgeport, Conn. (stud, threaded type)
Ritter Pattern & Casting Co., New York, N. Y. (jack type adjustable tunnel stanchion)
Rockwood Sprinkler Co., Worcester, Mass.
Schaub Engineering Co., Fred H., Chicago, Ill. (pipe stands)
Steel City Electric Co., Pittsburgh, Pa. (clamps, clips, rollers, hangers)
Truscon Steel Div., Republic Steel Corp., Youngstown, O. (pressed steel inserts)
Unistrut Products Co., Chicago, Ill.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa. (cartridge stud driver)
Vibration Mountings, Inc., Corona, N. Y. (vibration hangers)
Western Wire Products Co., St. Louis, Mo. (wire pipe hooks and perforated hanger iron; copper tubing hanger & slings)

HARD RUBBER PIPE AND FITTINGS

See Pipe, Hard Rubber; Fittings, Pipe, Hard Rubber

HARDWARE

See Parts for Heating and Air Conditioning Equipment

HEADERS, PIPE, WELDED

Albert Pipe Supply Co., Brooklyn, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Pipe & Steel Corp., Alhambra, Calif.
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Atlantic Pipe Bending & Fabricating Corp., Wood-Ridge, N. J.
Biggs Boiler Wks. Co., The, E. Akron, O.
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa.
Buffalo Tank Corp., Dunellen, N. J.
Chicago Nipple Mfg. Co., Cicero, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Elmwood, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crane Co., Chicago, Ill.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Dravo Corp., Machinery Div., Pittsburgh, Pa.

Flori Pipe Co., The, St. Louis, Mo.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Air Conditioning & Refrigeration Cooling Tower Div., Whittier, Calif.
Grinnell Co., Inc., Providence, R. I.
Heat & Power Corp., Baltimore, Md.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Kellogg Co., M. W., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Michigan Pipe Co., Gagetown, Mich.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Philadelphia Pipe Bending Co., Philadelphia.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Portland Copper and Tank Works, Inc., South Portland, Me.
Reco Products Div., Recony Corp., New York, N. Y.
Red Jacket Co., Inc., Carnegie, Pa.
Rempe Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Shaw Co., Benjamin F., Wilmington, Del.
Shaw-Kendall Engineering Co., Toledo, O.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Engineering Corp., Detroit, Mich.
Taylor Forge & Pipe Wks., Chicago, Ill.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., Milwaukee, Wis.
Walworth Co., New York, N. Y.
Western Piping & Engineering Co., San Francisco, Calif.
Whitlock Mfg. Co., W. Har'ford, Conn.

HEADS, EXHAUST, FOR PIPE LINES

Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Centrifix Corp., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Hoppes Mfg. Co., Inc., Springfield, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Swartwout Co., The, Cleveland, O.
U. S. Pipe & Mfg. Co., San Francisco, Calif.
Wright-Austin Co., Detroit, Mich.

HEADS, SAFETY

Black, Sivalls & Bryson, Inc., Kansas City, Mo.

HEADS, SPRINKLER, FOR FIRE PROTECTION

Grinnell Co., Inc., Providence, R. I.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.

HEAT EXCHANGERS

See Chillers, Water; Condensers, Refrigerating; Exchangers, Heat; Surface, Finned, Cooling; Surface, Finned, Heating

HEAT PUMPS

See Units, Air Conditioning, Reverse Refrigeration Cycle

HEAT RECOVERY UNITS

See Units, Heat Recovery

HEAT REGENERATORS

See Units, Heat Recovery

HEATERS, AIR, DIRECT FIRED, COAL

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

American Furnace Co., St. Louis, Mo.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Meyer Furnace Co., The, Peoria, Ill.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Rosebraugh Co., W. W., Salem, Ore.

HEATERS, AIR, DIRECT FIRED, COMBINATION GAS AND OIL

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
Auto-Therm Mfg. Co., Detroit, Mich.
Chicago Steel Furnace Co., Chicago, Ill.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Gas Machinery Co., Cleveland, O.
Inland Heater Corp., Minneapolis, Minn.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corp., Wilmington, Del.
Lennox Industries, Inc., Columbus, O.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., Minneapolis, Minn.
National Heater Co., St. Paul, Minn.
Newcomb-Detroit Co., Detroit, Mich.
Olson & Co., Arthur A., Canfield, O.
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Rockwell Co., W. S., Fairfield, Conn.
Ross Engineering Corp., J. O., New York, N. Y.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.

HEATERS, AIR, DIRECT FIRED, GAS, CENTRIFUGAL FAN TYPE

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
Auburn Burner Co., Auburn, Ind.
Automatic Gas Equipment Co., Pittsburgh, Pa.
Auto-Therm Mfg. Co., Detroit, Mich.
Besser Metal Products Corp., Charlotte, N. C.
Bryant Industrial Products Corp., Cleveland, O.
Burdett Mfg. Co., Chicago, Ill.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Coleman Co., Inc., The, Wichita, Kans.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
General Gas Light Co., Kalamazoo, Mich.
Hastings Air Control, Inc., Omaha, Nebr.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Inland Heater Corp., Minneapolis, Minn.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Johnson Heater Corp., Chelsea, Mass. (with and without ducts)
Kilbury Mfg. Co., Inc., Lawndale, Calif.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., Minneapolis, Minn.
Mid-Continent Metal Products Co., Chicago, Ill.
Mueller Climatrol, Milwaukee, Wis.
National Heater Co., St. Paul, Minn.
Newcomb-Detroit Co., Detroit, Mich.
Norman Products Co., Inc., Columbus, O.
Olson & Co., Arthur A., Canfield, O.
OverHead Heaters, Inc., Detroit, Mich.
Payne Div. of Carrier Corp., Monrovia, Calif.
Peerless Mfg. Corp., Louisville, Ky.
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Reznor Mfg. Co., Mercer, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Sterlairco, Inc., Westfield, Mass.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Surface Combustion Corp., Toledo, O.
Tjernlund Mfg. Co., St. Paul, Minn.
Tuck-Aire Furnace Co., San Francisco, Calif.
United States Air Conditioning Corp., Philadelphia, Pa.
Utility Appliance Corp., Los Angeles, Calif.
Vapor Heating Corp., Chicago, Ill.
Young Radiator Co., Racine, Wis.
Zink Co., John, Tulsa, Okla.

HEATERS, AIR, DIRECT FIRED, GAS, PORTABLE, FOR SPACE HEATING

(State capacity)

Auto-Therm Mfg. Co., Detroit, Mich. (400,000 to 2,000,000 Btu per hr output)
Bica Co., Girard, O. (50,000-85,000 Btu)
Insto-Gas Corp., Detroit, Mich.
Olson & Co., Arthur A., Canfield, O. (300,000 to 2,000,000 Btu per hr output)
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Summit Products Co., Uniontown, Pa. (125,000 Btu)

HEATERS, AIR, DIRECT FIRED, OIL, FLOOR TYPE

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Foundry & Furnace Co., Bloomington, Ill.
Armstrong Furnace Co., Div. of Union Electric Corp., Columbus, O.
Auto-Therm Mfg. Co., Detroit, Mich.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Inland Heater Corp., Minneapolis, Minn.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Johnson Heater Corp., Chelsea, Mass. (with and without ducts)
Lee Corp., Wilmington, Del.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., Minneapolis, Minn.
Meyer Furnace Co., The, Peoria, Ill.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Ross Engineering Corp., J. O., New York.
Tjernlund Mfg. Co., St. Paul, Minn.
Vapor Heating Corp., Chicago, Ill.
Williams Div., Eureka Williams Corp., Bloomington, Ill.
York-Shipley, Inc., York, Pa.

HEATERS, AIR, DIRECT FIRED, OIL, PORTABLE, FOR SPACE HEATING

Air Conditioning Engineering Co., Cambridge, Mass. (200,000; 285,000; 425,000 and 635,000 Btu)
Airtherm Mfg. Co., St. Louis, Mo. (400,000 to 2,000,000 Btu output per hr)
American Foundry & Furnace Co., Bloomington, Ill. (400,000-2,000,000 Btu per hr)
Armstrong Furnace Co., Div. of Union Electric Corp., Columbus, O. (350,000-450,000 Btu per hr)
Auburn Burner Co., Auburn, Ind.
Auto-Therm Mfg. Co., Detroit, Mich. (400,000 to 2,000,000 Btu per hr output)
Campbell Heating Co., Des Moines, Ia. (Up to 3,150,000 Btu)
Cauhorn Distributing Co., Detroit, Mich. (190,000 Btu)
Certified Furnace Corp., Trenton, N. J. (112 — 280,000 Btu per hr output)
Chicago Steel Furnace Co., Chicago, Ill.
Clayton Mfg. Co., El Monte, Calif.
Delta Heating Corp., Trenton, N. J.
Fageol Co., R. D., Heat Machine Div., Kent, O. (168,000 and 189,000 Btu)

Interstate Heater Mfg. Co., Denver, Colo. (80,000-180,000 Btu per hr)
Jackson & Church Co., Saginaw, Mich. (400,000 Btu — 2,000,000 Btu per hr output at Bonnet)
Johnson Heater Corp., Chelsea, Mass. (500,000 Btu)
Lennox Industries, Inc., Marshalltown, Ia. (245,000 Btu per hr)
Master Vibrator Co., Dayton, O.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O. (300,000-2,000,000 Btu per hr output)
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn. (100,000 Btu up to 2,225,000 Btu)
Quiet Automatic Oil Burner Corp., Newark, N. J.
Tjernlund Mfg. Co., St. Paul, Minn.

HEATERS, AIR, DIRECT FIRED, OIL, SUSPENDED TYPE

For Furnaces for Central Plant Installation, EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Furnace Co., St. Louis, Mo.
Auburn Burner Co., Auburn, Ind.
Auto-Therm Mfg. Co., Detroit, Mich.
Bard Mfg. Co., Bryan, O.
Besser Metal Products Corp., Charlotte, N. C.
Campbell Co., E. K., Kansas City, Mo.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Cox Mfg. Co., Ridgeville, Ind.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fluid Heat Div., Anchor Post Products, Inc., Baltimore, Md.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.
Inland Heater Corp., Minneapolis, Minn.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corp., Wilmington, Del.
Lennox Industries, Inc., Columbus, O.
Mueller Climatrol, Milwaukee, Wis.
National Heater Co., St. Paul, Minn.
Olsen Mfg. Co., C. A., Elyria, O.
Olson & Co., Arthur A., Canfield, O.
OverHead Heaters, Inc., Detroit, Mich.
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Syncromatic Corp., Watertown, Wis.
Thermo-Products, Inc., North Judson, Ind.
Tjernlund Mfg. Co., St. Paul, Minn.
Viking Mfg. Corp., Cleveland, O.
Waterman-Waterbury Co., The, Minneapolis, Minn.
Weatherall Engineers, Inc., Providence, R. I.
Williams Div., Eureka Williams Corp., Bloomington, Ill.
Williamson Co., Cincinnati, O.

HEATERS, CONVECTION

See Radiation, Convection Type

HEATERS, DUCT, ELECTRIC

Brown Fintube Co., The, Elyria, O.
Consolidated Metal Products Corp., Albany, N. Y.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Electro-Therm, Inc., Silver Spring, Md.
Falcon Equipment Co., New Brighton, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Montgomery Bros., San Francisco, Calif.
Tenney Engineering, Inc., Newark, N. J.
Trent, Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wing Mfg. Co., L. J., Linden, N. J.

HEATERS, DUCT, GAS

Allan Engineering Co., Dallas, Tex.
Automatic Gas Equipment Co., Pittsburgh, Pa.
Auto-Therm Mfg. Co., Detroit, Mich.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Campbell Heating Co., Des Moines, Ia.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
General Gas Light Co., Kalamazoo, Mich.
Hastings Air Control, Inc., Omaha, Nebr.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Inland Heater Corp., Minneapolis, Minn.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Kehm Corp., The, Chicago, Ill.
Kleer Kleen Mfg. Co., Hayward, Calif.
Lennox Industries, Inc., Marshalltown, Ia.
Maxon Premix Burner Co., Muncie, Ind.
Meyer Furnace Co., The, Peoria, Ill.
Modine Mfg. Co., Racine, Wis.
National Heater Co., St. Paul, Minn.
Norman Products Co., Inc., Columbus, O.
Olsen Mfg. Co., C. A., Elyria, O.
OverHead Heaters, Inc., Detroit, Mich.
Payne Div. of Carrier Corp., Monrovia, Calif.
Peerless Mfg. Corp., Louisville, Ky.
Reznor Mfg. Co., Mercer, Pa.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Sterlairco, Inc., Westfield, Mass.
Surface Combustion Corp., Toledo, O.
Tuck-Aire Furnace Co., San Francisco, Calif.
United States Air Conditioning Corp., Philadelphia, Pa.
Utility Appliance Corp., Los Angeles, Calif.
Viking Mfg. Corp., Cleveland, O.
Wing Mfg. Co., L. J., Linden, N. J.

HEATERS, DUCT, OIL FIRED

Auto-Therm Mfg. Co., Detroit, Mich.
Campbell Heating Co., Des Moines, Ia.
Century Engineering Corp., Cedar Rapids, Ia.
Certified Furnace Corp., Trenton, N. J.
Chicago Steel Furnace Co., Chicago, Ill.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Inland Heater Corp., Minneapolis, Minn.
Interstate Heater Mfg. Co., Denver, Colo.
Jackson & Church Co., Saginaw, Mich.
Kleer Kleen Mfg. Co., Hayward, Calif.
National Heater Co., St. Paul, Minn.
OverHead Heaters, Inc., Detroit, Mich.
Republic Products Co., Philadelphia, Pa.
Viking Mfg. Corp., Cleveland, O.

HEATERS, ELECTRIC, OIL-HEATING, FOR PREVENTING FOAMING IN CRANKCASE COMPRESSOR OIL

Electro-Therm, Inc., Silver Spring, Md.
Heatube Corp., Allegan, Mich.
Henry Furnace Co., The, Medina, O.
Vulcan Electric Co., Danvers, Mass.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, FEEDWATER

See Deaerators

HEATERS, GASOLINE FIRED (FOR AIRCRAFT AND PORTABLE GROUND USE)

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
Coleman Co., Inc., The, Wichita, Ks.
Fluid Heat Div., Anchor Post Products Inc., Baltimore, Md.
National Heater Co., St. Paul, Minn.
Perfection Industries Div., Hupp Corp., Cleveland, O.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Surface Combustion Corp., Toledo, O.

HEATERS, INDIRECT, SUBMERGED

American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., Elyria, O.
Buxton Mfg. Co., Dover, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
General Ceramics Corp., Keasbey, N. J. (quartz & graphite)
General Fittings Co., East Greenwich, R. I.
Gerstein & Cooper, Inc., South Boston, Mass.
Graham Mfg. Co., Inc., New York, N. Y.
Heatube Corp., Allegan, Mich.
Killebrew Engineering Corp., St. Louis, Mo.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Newcomb-Detroit Co., Detroit, Mich. (gas)
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Richmond Engineering Co., Richmond, Va.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Western Blower Co., Seattle, Wash.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, OIL

See Preheaters, Fuel Oil; Units, Fuel Oil, Heating, Pumping and Straining

HEATERS, RADIATION, FOR SUPPLYING HOT WATER RADIATION FROM STEAM BOILER

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
Alstrom Corp., New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Lindy Heaters, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Viking Mfg. Corp., Cleveland, O.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, STEAM JET, FOR LIQUIDS

Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Duriron Co., Inc., The, Dayton, O.
Heil Process Equipment Corp., Cleveland, O.
National Carbon Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Sims Pump Valve Co., Hoboken, N. J.

HEATERS, STRIP AND IMMERSION, ELECTRIC

American Instrument Co., Inc., Silver Spring, Md.
Consolidated Metal Products Corp., Albany, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Electro-Therm, Inc., Silver Spring, Md.
Falcon Equipment Co., New Brighton, Pa.
Ferro Electric Products, Inc., Kirkland, Ill. (electric heating elements for room air conditioners)
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
Heil Process Equipment Corp., Cleveland, O.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Red Spot Electric Co., Tacoma, Wash.
S&C Mfg. Co., Cincinnati, O.
Syntron Co., Homer City, Pa.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, SUSPENDED, RADIANT, ELECTRIC

Berko Electric Mfg. Co., Queens Village, N. Y.

Crystalheat Co., Van Nuys, Calif.
Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Electriglas Corp., Bergenfield, N. J.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
S&C Mfg. Co., Cincinnati, O.
Thermador Electrical Mfg., Los Angeles, Calif.
ThermoRay Corp., Newark, N. J.
Trent, Inc., Philadelphia, Pa.
Union Chill Mat Co., Pittsburgh, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, SUSPENDED, RADIANT, GAS FIRED

Coleman Co., Inc., The, Wichita, Kans.
Perfection Industries Div., Hupp Corp., Cleveland, O.
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Union Chill Mat Co., Pittsburgh, Pa.

HEATERS, UNIT, ELECTRIC HEATING ELEMENT

Ceilheat, Inc., Knoxville, Tenn.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Crystalheat Co., Van Nuys, Calif.
Electriglas Corp., Bergenfield, N. J.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Electro-Therm, Inc., Silver Spring, Md.
Everwarm, Inc., Knoxville, Tenn.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Lintern Corp., Painesville, O.
Marviray, Inc., Newark, N. J.
Modernheat Cable Corp., Kingsport, Tenn.
Palmer Mfg. Corp., Phoenix, Ariz.
Sunwarm, Inc., Kingsport, Tenn.
Thermador Electrical Mfg., Los Angeles.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wing Mfg. Co., L. J., Linden, N. J.

HEATERS, UNIT, ELECTRIC HEATING ELEMENT, EXPLOSION PROOF

Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
Electro-Therm, Inc., Silver Spring, Md.
Heatube Corp., Allegan, Mich.
Ilg Electric Ventilating Co., Chicago, Ill.
Trent, Inc., Philadelphia, Pa.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, UNIT, GAS, PROPELLER FAN TYPE

Airtherm Mfg. Co., St. Louis, Mo.
Allan Engineering Co., Dallas, Tex.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Furnace Co., St. Louis, Mo.
Automatic Gas Equipment Co., Pittsburgh, Pa.
Barwick Mfg. Corp., Wichita, Kan.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Carrier Corp., Syracuse, N. Y.
Clow & Sons, Inc., James B., Chicago, Ill.
Day & Night Mfg. Co., Monrovia, Calif.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
General Gas Light Co., Kalamazoo, Mich.
Grinnell Co., Inc., Providence, R. I.
Hastings Air Control, Inc., Omaha, Nebr.
Henry Furnace Co., The, Medina, O.
Ilg Electric Ventilating Co., Chicago, Ill.
Jackson & Church Co., Saginaw, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., Columbus, O.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Mission Appliance Corp., Hawthorne, Calif.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O.
Ohio Foundry & Mfg. Co., Steubenville, O.
Olsen Mfg. Co., C. A., Elyria, O.
Payne Div. of Carrier Corp., Monrovia, Calif.
Peerless Mfg. Corp., Louisville, Ky.
Reznor Mfg. Co., Mercer, Pa.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Sterlairco, Inc., Westfield, Mass.
Surface Combustion Corp., Toledo, O.
Temco, Inc., Nashville, Tenn.
Trane Co., The, La Crosse, Wis.
Tuck-Aire Furnace Co., San Francisco, Calif.
United States Air Conditioning Corp., Philadelphia, Pa.
Utility Appliance Corp., Los Angeles, Calif.
Vacuum Gas Burner, Olean, N. Y.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Worthington Corp., Harrison, N. J.
Young Radiator Co., Racine, Wis.
Zink Co., John, Tulsa, Okla.

HEATERS, UNIT, OIL, PROPELLER FAN TYPE

Delta Heating Corp., Trenton, N. J.
Interstate Heater Mfg. Co., Denver, Colo.
Sterlairco, Inc., Westfield, Mass.

HEATERS, UNIT, STEAM AND HOT WATER, CABINET TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Thermal Industries, Inc., Detroit, Mich.
Brown Products Corp., Forest Hills, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Modine Mfg. Co., Racine, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Trane Co., The, La Crosse, Wis.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Young Radiator Corp., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, CENTRIFUGAL FAN TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Thermal Industries, Inc., Detroit.
Bishop & Babcock Mfg. Co., Cleveland, O.
Blazer & Son, M., Passiac, N. J.
Brown Products Corp., Forest Hills, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Hastings Air Control, Inc., Omaha, Nebr.
Kennard Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, La Crosse, Wis.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
Young Radiator Co., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, HORIZONTAL BLOW

Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Beacon-Morris Corp., Boston, Mass.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Buffalo, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Grinnell Co., Inc., Providence, R. I.
Hartzell Propeller Fan Co., Piqua, O.
Ilg Electric Ventilating Co., Chicago, Ill.
King Co. of Owatonna, The, Owatonna, Minn.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Kritzer Radiant Coils, Inc., Chicago, Ill.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Merchant & Evans Co., Philadelphia, Pa.
Modine Mfg. Co., Racine, Wis.
Muckle Mfg. Co., Owatonna, Minn.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Pacific Steel Boiler Div., National-U.S. Radiator Corp. Johnstown, Pa.
Rittling Corp., The, Buffalo, N. Y.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.
Wing Mfg. Co., L. J., Linden, N. J.
Young Radiator Co., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, VERTICAL BLOW

Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Beacon-Morris Corp., Boston, Mass.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Gallaher Co., The, Omaha, Neb.
Grinnell Co., Inc., Providence, R. I.
Ilg Electric Ventilating Co., Chicago, Ill.
Kritzer Radiant Coils, Inc., Chicago, Ill.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Rittling Corp., The, Buffalo, N. Y.
Silco Products Inc., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.

Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J. (Revolving)
Young Radiator Co., Racine, Wis.

HEATERS, VENTILATION

See Surface, Finned, Heating; Ventilators, Roof, Fan; Ventilators, Unit; Surface, Finned, Heating; Ventilators, Roof, Fan

HEATERS, WALL, CIRCULATING, ELECTRIC

Biglin & Co., Inc., H. C., Atlanta, Ga.
Broan Mfg. Co., Inc., Hartford, Wis.
Ceilheat, Inc., Knoxville, Tenn.
Modernheat Cable Corp., Kingsport, Tenn.
Sunwarm, Inc., Kingsport, Tenn.
Thermador Electrical Mfg., Los Angeles, Calif.
ThermoRay Corp., Newark, N. J.
Trade-Wind Motorfans, Inc., Rivera, Calif. (wall insert type)
Wesix Electric Heater Co., San Francisco, Calif.

HEATERS, WALL, CIRCULATING, GAS FIRED

Advance Furnace Co., Wichita, Kans.
Coleman Co., Inc., The, Wichita, Kan.
Day & Night Mfg. Co., Monrovia, Calif.
Dearborn Stove Co., Dallas, Tex
General Gas Light Co., Kalamazoo, Mich.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Lennox Industries, Inc., Marshalltown, Ia.
Mission Appliance Corp., Hawthorne, Calif.
Ohio Foundry & Mfg. Co., Steubenville, O.
Payne Div. of Carrier Corp., Monrovia, Calif.
Peerless Mfg. Corp., Pittsburgh, Pa.
Rheem Mfg. Co., Chicago, Ill.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Temco, Inc., Nashville, Tenn.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Zink Co., John, Tulsa, Okla.

HEATERS, WALL, CIRCULATING, OIL FIRED

Delta Heating Corp., Trenton, N. J.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Kleer Kleen Mfg. Co., Hayward, Calif.
Kresky Mfg. Co., Petaluma, Calif.
Monogram Products Co., Inc., Philadelphia, Pa.

HEATERS, WATER, AIR-TANKLESS

Tankless Water Heater and Compression Tank Combined

American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
General Fittings Co., East Greenwich, R. I.

HEATERS, WATER, CAST IRON, COAL FIRED

Adams Co., The, Dubuque, Ia.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Burnham Corp., Irvington, N. Y.
National-U. S. Radiator Corp., Johnstown, Pa.
Peerless Heater Co., The, Div. of The Eastern Foundry Co., Boyertown, Pa.
Prox Co., Inc., Frank, Terre Haute, Ind.
Smith Co., Inc., H. B., The, Westfield, Mass.
Weil-McLain Co., Michigan City, Ind.

HEATERS, WATER, ELECTRIC

Auburn Burner Co., Auburn, Ind.
Bastian-Morley Co., Inc., LaPorte, Ind.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Cleveland Heater Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Crane Co., Chicago, Ill.
Custom Engineering Co., Los Angeles, Calif.
Cutler-Hammer, Inc., Milwaukee, Wis.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Electro-Therm, Inc., Silver Spring, Md.
Frigidaire Div., General Motors Corp., Dayton, O.
Hanson-Gates Mfg. Co., Inc., Reading, Mass.
Heat-X Inc., Brewster, N. Y.
Heatube Corp., Allegan, Mich.
Hotpoint Co., Chicago, Ill.
Hotstream Heater Co., Cleveland, O.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
McGraw Electric Co., Clark Div., Chicago, Ill.
Mission Appliance Corp., Hawthorne, Calif.
National Steel Construction Co., Logansport, Ind.
National-U. S. Radiator Corp., Johnstown, Pa.
Precision Parts Corp., Nashville, Tenn.
Red Spot Electric Co., Tacoma, Wash.
Rheem Mfg. Co., Chicago, Ill.
Thermador Electric Mfg., Los Angeles, Calif.
Viking Mfg. Corp., Cleveland, O.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wood Co., John, Conshohocken, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, WATER, GAS FIRED

Ajax Boiler & Heater Co., Gardena, Calif.
Aldrich Co., Wyoming, Ill.
Allcraft Mfg. Co., Cambridge, Mass.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bica Co., Girard, O.
Bock Corp., Madison, Wis.
Brown Products Corp., Forest Hills, N. Y.
Bryan Steam Corp., Peru, Ind.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Cleveland Heater Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Crane Co., Chicago, Ill.
Day & Night Mfg. Co., Monrovia, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Hanson-Gates Mfg. Co., Inc., Reading, Mass.
Hotstream Heater Co., Cleveland, O.
Hydrotherm, Inc., Northvale, N. J.
Kehm Corp., The, Chicago, Ill.
McGraw Electric Co., Clark Div., Chicago, Ill.
Mission Appliance Corp., Hawthorne, Calif.
Montgomery Bros., San Francisco, Calif.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
Mund Boilers, Inc., Los Angeles, Calif.
National Steel Construction Co., Logansport, Ind.
National-U. S. Radiator Corp., Johnstown, Pa.
Norse Boiler Co., Inc., New Market, N. J.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Pioneer Water Heater Corp., Los Angeles, Calif.
Radiant Heat and Cooling Co., Santa Clara, Calif.
Radiant Utilities Corp., Brooklyn, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Raypak Co., Inc., Los Angeles, Calif.
Rheem Mfg. Co., Chicago, Ill.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Rudd Mfg. Co., Kalamazoo, Mich.
Schoedinger, Inc., F. O., Columbus, O.
Sellers Engineering Co., Chicago, Ill.
Smith Co., Inc., H. B., The, Westfield, Mass.
Stout & Sons, David, St. Louis, Mo.
Sullivan Valve & Engineering Co., Butte, Mont.
Viking Mfg. Corp., Cleveland, O.
Wood Co., John, Conshohocken, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, WATER, INDIRECT

Alstrom Corp., New York, N. Y.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Davis Engineering Corp., Elizabeth, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Ferguson & Lange Foundry Co., Chicago, Ill.
General Fittings Co., East Greenwich, R. I.
Graham Mfg. Co., Inc., New York, N. Y.
Harrison Sheet Steel Co., Chicago, Ill.
Hydrotherm, Inc., Northvale, N. J.
Kehm Corp., The, Chicago, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Lewis & Saunders, Lakeport, N. H.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Novelty Steam Boiler Wks., Inc., Baltimore, Md.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Sellers Engineering Co., Chicago, Ill.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, WATER, INDIRECT, COMBINATION TANK AND TANKLESS

Alstrom Corp., New York, N. Y.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Buxton Mfg. Co., Dover, N. J.
Carpenter Heating & Stoker Co., Cleveland, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Corp., Flushing, Long Island, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
General Ceramics Corp., Keasbey, N. J. (quartz & graphite)
General Fittings Co., East Greenwich, R. I.
Hydrotherm, Inc., Northvale, N. J.
Killebrew Engineering Corp., St. Louis, Mo.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Novelty Steam Boiler Wks., Inc., Baltimore, Md.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Richmond Engineering Co., Richmond, Va.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Weil-McLain Co., Michigan City, Ind.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, WATER, OIL FIRED

Aeroil Products Co., Inc., South Hackensack, N. J.
Aldrich Co., Wyoming, Ill.
Alstrom Corp., New York, N. Y.
Auburn Burner Co., Auburn, Ind.
Bock Corp., Madison, Wis.
Brown Products Corp., Forest Hills, N. Y.
Bryan Steam Corp., Peru, Ind.
Burnham Corp., Irvington, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Delta Heating Corp., Trenton, N. J.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.

Electrol Burner Mfg. Co., Inc., Rutherford, N. J.
Hanson-Gates Mfg. Co., Inc., Reading, Mass.
Hotstream Heater Co., Cleveland, O.
Johnson Co., S. T., Oakland, Calif.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Mund Boilers, Inc., Los Angeles, Calif.
National-U. S. Radiator Corp., Johnstown, Pa.
Norse Boiler Co., Inc., New Market, N. J.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Petro, Cleveland, O.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Radiant Utilities Corp., Brooklyn, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Reif-Rexoil, Inc., Buffalo, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Smith Co., Inc., H. B., The, Westfield, Mass.
Vapor Heating Corp., Chicago, Ill.
Viking Mfg. Corp., Cleveland, O.

HEATERS, WATER, STEAM, INSTANTANEOUS

Aerco Corp., Northvale, N. J.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Buxton Mfg. Co., Dover, N. J.
Coe Mfg. Co., Painesville, O. (safety water heater)
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cooley Co., E. C., San Francisco, Calif.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
General Fittings Co., East Greenwich, R. I.
Gerstein & Cooper, Inc., South Boston, Mass.
Graham Mfg. Co., Inc., New York, N. Y.
Hasco Valve & Machine Co., Milwaukee, Wis.
Johnson Corp., The, Three Rivers, Mich.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp., Kewanee, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lewis & Saunders, Lakeport, N. H.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Marion Machine Foundry & Supply Co., Marion, Ind.
Montgomery Bros., San Francisco, Calif.
Mueller Climatrol, Milwaukee, Wis.
National Pipe Bending Co., New Haven, Conn.
Novelty Steam Boiler Works, Inc., Baltimore, Md.
O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pick Mfg. Co., West Bend, Wis. (direct steam injection)
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Radiant Utilities Corp., Brooklyn, N. Y.
Richmond Engineering Co., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Screw Machine Products Co., Portland, Ore.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Viking Mfg. Corp., Cleveland, O.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Water Heaters, Inc., Bronx, N. Y.

HEATERS, WATER, STEAM, STORAGE

Aerco Corp., Northvale, N. J.
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., Somerville, Mass.
Davis Engineering Corp., Elizabeth, N. J.
General Fittings Co., East Greenwich, R. I.
Gerstein & Cooper, Inc., South Boston, Mass.
Johnson Corp., The, Three Rivers, Mich.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp., Kewanee, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lindy Heaters, Inc., New York, N. Y.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Marion Machine Foundry & Supply Co., Marion, Ind.
National Pipe Bending Co., New Haven, Conn.
Novelty Steam Boiler Wks., Inc., Baltimore, Md.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Quaker City Iron Works, Philadelphia, Pa.
Richmond Engineering Co., Richmond, Va.
Schaub Engineering Co., Fred H., Chicago.
Sims Co., Erie, Pa.
Stout & Sons, David, St. Louis, Mo.
Taco Heaters, Inc., Cranston, R. I.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Tranter Mfg. Inc., Lansing, Mich.
Viking Mfg. Corp., Cleveland, O.
Vogt Machine Co., Henry, Louisville, Ky.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., W. Hartford, Conn.
Yula Water Heaters Inc., Bronx, N. Y.

HEATERS, WATER, STEEL, COAL FIRED

Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Johnston Bros., Inc., Ferrysburg, Mich.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp. Kewanee, Ill.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Terre Haute Boiler Works Co., Terre Haute, Ind.

HEATING BOILERS

See Boilers, Heating

HEATING COILS

See Surface, Finned, Heating

HEATING SURFACE

See Surface, Finned, Heating

HIGH VELOCITY MIXING UNITS, SOUND AND VOLUME CONTROL, FOR AIR CONDITIONING SYSTEMS

See Units, Mixing, Sound and Volume Control, for Double Duct High Velocity Air Conditioning Systems

HOISTS, PORTABLE, FOR INSTALLING HEATING, PIPING AND AIR CONDITIONING EQUIPMENT

Broad Crane & Engineering Service Co., Detroit, Mich.
Burtchaell Heating Co., Portland, Ore.
Chicago Pneumatic Tool Co., New York, N. Y.
Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Clipper Mfg. Co., Kansas City, Mo.
Coffing Hoist Div., Duff-Norton Co., Danville, Ill.
Detroit Hoist & Machine Co., Detroit, Mich.
Harnischfeger Corp., Milwaukee, Wis.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Lug-All Co., The, Haverford, Pa.
Memco, Oklahoma City, Okla.
Multiple Corp., Dayton, O.
Thor Power Tool Co., Aurora, Ill.
Wallace Products Co., B. E., Exton, Pa. (adjustable tripods, gantries)

HOLDERS AND FILES, CATALOG, FOR ENGINEERS' AND CONTRACTORS' OFFICES

Geneva Mfg. Co., South Elgin, Ill.

HOODS, FUME DISPOSAL, LABORATORY

Atlas Mineral Products Co., Mertztown, Pa.
Corite Products, Inc., Chicago, Ill. (plastic)
Ervite Corp., Erie, Pa.
Griffin & Co., Louisville, Ky.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Kewaunee Mfg. Co., Adrian, Mich.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Sheldon Equipment Co., E. H., Muskegon, Mich.
United Sheet Metal Co., Inc., Columbus, O.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Yerzley & Co., Newark, N. J.
Zack Co., The, Chicago, Ill.

HOSE CLAMPS

See Clamps, Hose

HOSE, FLEXIBLE, METAL, AND FITTINGS

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
American Metal Hose Div., American Brass Co., Waterbury, Conn.
Ammerman Inc., Minneapolis, Minn.
Atlantic Metal Hose Co., Inc., New York, N. Y.
Breeze Corporations, Inc., Union, N. J.
Chiksan Co., Brea, Calif.
Cobra Metal Hose Div., Chicago, Ill.
Dole Refrigerating Co., Chicago, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Flexible Tubing Corp., Guilford, Conn.
Flexonics Corp., Maywood, Ill.
Goodall Rubber Co., Trenton, N. J.
International Metal Hose Co., Bellevue, O.
Johnson Metal Hose, Inc., Waterbury, Conn.
Marquette Coppersmithing Co., Philadelphia, Pa.
Mic-Lin Co., Maple Shade, N. J.
Newage International, Inc., Jenkintown, Pa.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Perfecting Service Co., Charlotte, N. C.
Seamlex Co., Inc., Long Island City, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Titeflex, Inc., East Springfield, Mass.
United Metal Hose Co., Inc., Long Island City, N. Y.
Universal Metal Hose Co., Chicago, Ill.
Vibration Mountings, Inc., Corona, N. Y.
Zallea Brothers, Wilmington, Del.

HOSE, NON-METAL, AND FITTINGS

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Aeroquip, Inc., Van Wert, O.
Ammerman Inc., Minneapolis, Minn.
Anchor Coupling Co., Libertyville, Ill.
Anchor Packing Co., Philadelphia, Pa.
Arrowhead Rubber Co., Long Beach, Calif.
Binks Mfg. Co., Chicago, Ill.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Continental Rubber Works, Erie, Pa.
De Vilbiss Co., The, Toledo, O.
Electric Hose & Rubber Co., Wilmington, Del.
Flexaust Co., New York, N. Y.
Flexible Tubing Corp., Guilford, Conn.
Gates Rubber Co., The, Denver, Colo.
Goodrich Co., B. F., Akron, O.

Goodrich Industrial Products Co., B. F., Akron, O. (rubber)
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins Inc., Stamford, Conn.
Imperial Brass Mfg. Co., Chicago, Ill.
LE-HI Div., Hose Accessories Co., Philadelphia, Pa.
New York Belting & Packing Co., Passaic, N. J.
Parker Appliance Co., The, Cleveland, O.
Polymer Corp. of Pa., The, Reading, Pa. (nylon pressure tubing)
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber and Tire Corp., Youngstown, O.
Resistoflex Corp., Roseland, N. J.
Roylyn, Inc., Glendale, Calif.
Snap-Tite, Inc., Union City, Pa.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Thermoid Co., Trenton, N. J.
Thor Power Tool Co., Aurora, Ill.
Titeflex, Inc., East Springfield, Mass.
United States Rubber Co., New York, N. Y.
Vibration Mountings, Inc., Corona, N. Y.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Yardley Plastic Co., Columbus, O.

HOSE, VENTILATING

See Ducts and Duct Fittings, Prefabricated, Non-Flexible, Non-Metallic

HOSPITAL OPERATING ROOM AIR CONDITIONING UNITS

See Units, Air Conditioning, Exclusively for Hospital Operating Rooms

HOT GAS DEFROSTING

See Systems, Hot Gas Defrosting for Refrigeration

HOT WATER HEATING AND CHILLED WATER SYSTEMS, BALANCING ELBOWS AND TEES FOR

See Elbows and Tees, Balancing, for Hot Water Heating and Chilled Water Systems

HOT WATER HEATING SYSTEMS

See Systems, Heating, Hot Water

HOT WATER PRESSURE REGULATORS

See Regulators, Pressure, Hot Water Heating Systems

HOUSINGS, FAN, CENTRIFUGAL

(Housing only—not complete fans)

Air Fan Engineering Co., Los Angeles, Calif.
Ammerman Inc., Minneapolis, Minn.
Barry Blower Co., Minneapolis, Minn.
Bishop & Babcock Mfg. Co., Cleveland, O.
Brookside Corp., McCordsville, Ind.
Brundage Co., The, Kalamazoo, Mich.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Commercial Shearing & Stamping Co., Youngstown, O.
Detroit Stamping Co., Detroit, Mich.
Ervite Corp., Erie, Pa.
General Blower Co., Morton Grove, Ill.
Haveg Industries, Inc., Newark, Del. (plastic for corrosive fumes)
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Martin Fan & Blower Co., Chicago, Ill.
Morrison Products, Inc., Cleveland, O.
Palmer Mfg. Corp., Phoenix, Ariz.
Revcor Inc., Carpentersville, Ill.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Torit Mfg. Co., St. Paul, Minn.
Torrington Mfg. Co., The, Torrington, Conn.
United Sheet Metal Co., Inc., Columbus, O.
United States Air Conditioning Corp., Philadelphia, Pa.
Utica Products, Inc., Utica, N. Y.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.

HOUSINGS, FAN, PROPELLER

(Housing only—not complete fans)

Allen Cooler & Ventilator, Inc., Rochester, Mich.
Ammerman Inc., Minneapolis, Minn.
Atmos Corp., Chicago, Ill.
Brookside Corp., McCordsville, Ind.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Commercial Shearing & Stamping Co., Youngstown, O.
Ervite Corp., Erie, Pa.
General Blower Co., Morton, Ill.
Haveg Industries, Inc., Newark, Del. (plastic for corrosive fumes)
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
International Engineering, Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Martin Fan & Blower Co., Chicago, Ill.
Palmer Mfg. Corp., Phoenix, Ariz.
United Sheet Metal Co., Inc., Columbus, O.

HUMIDIFIERS, CENTRAL PLANT

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
American Blower Corp., Detroit, Mich.
American Moistening Co., Providence, R. I.
Armstrong Machine Wks., Three Rivers, Mich.
Bahnson Co., Winston-Salem, N. C.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Cleveland Humidifier Co., Cleveland, O.
Farr Co., Los Angeles, Calif.
General Filters, Inc., Novi, Mich.
Hermidifier Co., Neffsville, Pa.
Johnson Service Co., Milwaukee, Wis.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla. (vaporizers for humidifiers)
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Powers Regulator Co., Skokie, Ill.
Research Products Corp., Madison, Wis.
Southworth Machine Co., Portland, Me.
Steel Products Engineering Co., Springfield, O.
Surface Combustion Corp., Toledo, O.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Walton Laboratories, Inc., Irvington, N. J.
Water Cooling Corp., New York, N. Y.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

HUMIDIFIERS, DIRECT, SPRAY HEAD

Abbeon Supply Co., Jamaica, N. Y.
American Moistening Co., Providence, R. I.
Anetsberger Bros., Inc., Northbrook, Ill.
Bahnson Co., Winston-Salem, N. C. (Centrifugal)
Binks Mfg. Co., Chicago, Ill.
Buffalo Forge Co., Buffalo, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Grinnell Co., Inc., Providence, R. I.
Hermidifier Co., Neffsville, Pa.
Lennox Industries, Inc., Marshalltown, Ia.
Maid-O'-Mist, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
Murray Mfg. Co., D. J., Wausau, Wis.
Parks-Cramer Co., Fitchburg, Mass.
R. I. Humidifier & Ventilating Co., Inc., Cambridge, Mass.
Roberson Co., L. N., Seattle, Wash.
Ross Sprinkler Co., Rosemead, Calif.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Supreme Electric Products Corp., Rochester, N. Y.
Walton Laboratories, Inc., Irvington, N. J.
Water Cooling Corp., New York, N. Y.

HUMIDIFIERS FOR RADIATORS AND CONVECTORS

Maid-O'-Mist, Inc., Chicago, Ill.
Skilbeck Mfg. Co., Kenosha, Wis.

HUMIDIFIERS, RADIATOR VENT VALVE

G & H Mfg. Co., Philadelphia, Pa.
Maid-O'-Mist, Inc., Chicago, Ill.
Skilbeck Mfg. Co., Kenosha, Wis.

HUMIDIFIERS, UNIT, ROOM TYPE

(Without Heating)

Abbeon Supply Co., Jamaica, N. Y.
American Moistening Co., Providence, R. I.
Armstrong Machine Wks., Three Rivers, Mich.
Bahnson Co., Winston-Salem, N. C.
Fresh'nd-Aire Co., Div. of Corey Corp., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Hermidifier Co., Neffsville, Pa.
Kelvinator Div., American Motors Corp., Detroit, Mich.
Murray Mfg. Co., D. J., Wausau, Wis.
Palmer Mfg. Corp., Phoenix, Ariz.
Research Products Corp., Madison, Wis.
Spraying Systems Co., Bellwood, Ill.
Standard Engineering Wks., Pawtucket, R. I.
Walton Laboratories, Inc., Irvington, N. J.
Water Cooling Corp., New York, N. Y.

HUMIDIFYING RADIATORS

See Radiators, Humidifying

HUMIDISTATS

Abbeon Supply Co., Jamaica, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Providence, R. I.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Parks-Cramer Co., Fitchburg, Mass.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Standard Engineering Wks., Pawtucket, R. I.
Trerice Co., H. O., Detroit, Mich.
Walton Laboratories, Inc., Irvington, N. J.

HUMIDITY INDICATORS

See Indicator-Controllers, Relative Humidity; Psychrometers

HUMIDITY RECORDERS

See Recorders, Humidity

HUMIDITY AND TEMPERATURE CONTROLS

See Humidistats; Recorder-Controllers; Thermostats

HYDRAULIC CLUTCHES

See Drives, Fluid or Hydraulic, for Power Transmission

HYDRAULIC PIPE PUSHERS

See Pushers, Pipe, Hydraulic

HYDRAULIC SPEED CHANGERS

See Changers, Speed, Hydraulic Coupling

HYGROMETERS

Airguide Instrument Co., Chicago, Ill.
Airserco Mfg. Co., Pittsburgh, Pa.
American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Providence, R. I.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Scientific Equipment Co., Philadelphia, Pa.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Manufacturers Engineering & Equipment Corp., Hatboro, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.

Precision Thermometer & Instrument Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electric Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Will Corp., Rochester, N. Y.

HYGROSTATS

See Humidistats

IDENTIFICATION MARKERS (For Piping Services)

Brady Co., W. H., Milwaukee, Wis. (self-sticking)
North Shore Nameplate Inc., Bayside, N. Y. (also for wiring and conduit systems)
Seton Name Plate Co., New Haven, Conn.
Westline Products Div. of Western Lithograph Co., Los Angeles, Calif.
Wilmington Plastics Co., Wilmington, Del.
Zaco Labs., Div. of Zip Abrasive Co., Cleveland, O.

IMMERSION THERMOSTATS

See Thermostats, Immersion

INCINERATORS, FOR LARGE BUILDINGS

Canton Stoker Corp., Canton, O.
Flynn & Emrich Co., Baltimore, Md. (stoker type)
Gober Incinerator Corp., Chicago, Ill.
Harmond Company, Cleveland, O.
Incinerator Products, Inc., Detroit, Mich.
Morse Boulger Destructor Co., New York, N. Y.
Plibrico Co., Chicago, Ill.
Syrall Mfg. Co., Syracuse, N. Y.

INDICATING THERMOMETERS

See Thermometers, Indicating

INDICATOR-CONTROLLERS, PRESSURE

Automatic Control Co., St. Paul, Minn.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Dickson Co., The, Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Giannini & Co., Inc., G M., Pasadena, Calif.
Hagan Corp., Pittsburgh, Pa.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Swartwout Co. The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

INDICATOR-CONTROLLERS, RELATIVE HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Providence, R. I.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

INDICATOR-CONTROLLERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co. Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Century Instrument Co., Detroit, Mich.
Cybertronic Corp. of America, Chester, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Fenwal Inc., Ashland, Mass.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Garden City Instruments, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Illinois Testing Laboratories, Inc., Chicago.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Electric Co., Inc., Saddle Brook, N. J.
Thwing-Albert Instrument Co., Philadelphia.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa.

INDICATORS, CARBON DIOXIDE, BOILER ROOM

For Portable CO_2 Analyzers, See Analyzers, Carbon Dioxide, Portable

Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Defender Instrument and Regulator Co., Boody, Ill.
Engelhard, Inc., Chas., East Newark, N. J.
General Scientific Equipment Co., Philadelphia, Pa.
Hays Corp., Michigan City, Ind.
Permutit Co., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Uehling Instrument Co., Paterson, N. J.

INDICATORS, DEW POINT

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Illinois Testing Laboratories, Inc., Chicago.
McIntire Co., The, Livingston, N. J.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Pittsburgh Lectrodryer Co., Pittsburgh, Pa.

INDICATORS, FLOW

See Meters, Flow

INDICATORS, LIQUID LEVEL, BOILER AND TANK

Automatic Control Co., St. Paul, Minn.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barton Instrument Corp., Los Angeles, Calif.
Boston Auto Gage Co., Pittsfield, Mass.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Daytronic Corp., Dayton, O.
Defender Instrument & Regulator Co., Boody, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Engelhard, Inc., Charles, East Newark, N. J.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Frick Co., Waynesboro, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Magnetrol, Inc., Chicago, Ill.
Mason-Neilan Div. of Worthington Corp., Norwood, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Petrometer Corp., Long Island City, N. Y.
Reliance Gauge Column Co., Cleveland, O.
Ripley Co., Inc., Middletown, Conn.
Swift Lubricator Co., Inc., Elmira, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Worner Electronic Devices, Rankin, Ill.
Yarnall-Waring Co., Philadelphia, Pa.

INDICATORS, pH

American Instrument Co., Inc., Silver Spring, Md.
Analytical Measurements, Inc., Chatham, N. J.
Berna Corp., Garwood, N. J.
Bristol Co., The, Waterbury, Conn.
Calgon, Inc., Pittsburgh, Pa.
Ernst Water Column & Gauge Co., Livingston, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Leeds & Northrup Co., Philadelphia, Pa.
Metropolitan Refining Co., Inc., Long Island City, N. Y.

Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Oakite Products, Inc., New York, N. Y.
Thomas Co., Arthur H., Philadelphia, Pa.
Thwing-Albert Instrument Co., Philadelphia.
Wallace & Tiernan Inc., Belleville, N. J.

INDICATORS, RELATIVE HUMIDITY

Abbeon Supply Co., Jamaica, N. Y.
Airguide Instrument Co., Chicago, Ill.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Instrument Co., Inc., Silver Spring, Md.
Beckman & Whitley, Inc., San Carlos, Calif.
El-Tronics, Inc., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Walton Laboratories, Inc., Irvington, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

INDICATORS, SOUND LEVEL

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Hermon Hosmer Scott, Inc., Cambridge, Mass.
Mine Safety Appliances Co., Pittsburgh, Pa.
Simpson Electric Co., Chicago, Ill.

INDIRECT HEATING SURFACE

See Surface, Finned, Heating

INDIRECT WATER HEATERS

See Heaters, Water, Indirect

INDUSTRIAL AIR CONDITIONERS

See Units, Air Conditioning, Industrial Type

INDUSTRIAL DRYERS

See Dryers, Industrial

INJECTOR RECIRCULATORS FOR REFRIGERANTS

Phillips & Co., H. A., Chicago, Ill.
Watkins Co., J. E., Maywood, Ill.

INSERTS, CONCRETE

Air-Path Products Co., Baltimore, Md.
Carty & Moore Engineering Co., Detroit, Mich.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Globe Products, Huppower Div., Hupp Corp., Detroit, Mich.
Grabler Mfg. Co., Cleveland, O.
Healy Ruff Co., St. Paul, Minn.
Hilti Rapid Fastening Systems, Inc., New York, N. Y.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Mult-A-Frame Div., Ainsworth Mfg. Corp., Detroit, Mich.
Phillips Drill Co., Michigan City, Ind.
Rockwood Sprinkler Co., Worcester, Mass.
South Chester Corp., Southco Div., Lester, Pa.
Steel City Electric Co., Pittsburgh, Pa.
Truscon Steel Div., Republic Steel Corp., Youngstown, O.
Unistrut Products Co., Chicago, Ill.

INSERTS, METAL FOR PLASTIC PIPE

Union Malleable Mfg. Co., Ashland, O.

INSTANTANEOUS WATER HEATERS

See Heaters, Water, Steam, Instantaneous

INSULATING CONCRETE

See Concrete, Insulating

INSULATION ANCHORS AND ADHESIVES

See Fasteners, Insulation

INSULATION, BOILER AND TANK

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J., (mineral wool blankets, monoblock, super powerhouse cement, #1 cement)
Bigelow Liptak Corp., Detroit, Mich.
Bird-Archer Co., Philadelphia, Pa.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Eagle-Picher Co., Cincinnati, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa. (Magnesia)
Fibreboard Paper Products Corp., San Francisco, Calif.
Forty-Eight Insulations, Inc., Aurora, Ill.
Grant Wilson, Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
International Vermiculite Co., Girard, Ill.
Johns-Manville, New York, N. Y.
Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
Keasbey & Mattison Co., Ambler, Pa.
L.O.F. Glass Fibers Co., Toledo, O.
Lockport Mills, Inc., Lockport, N. Y.
MMM, Inc., Houston, Tex. (low temperature)
Monsanto Chemical Co., Merimac Div., Boston, Mass.
Moore Products Co., Philadelphia, Pa.
Mundet Cork Corp., North Bergen, N. J. (Cork)
Munn and Steele, Inc., South Boston, Mass.
National Cork Co., Englewood, N. J. (Corkboard)
National Gypsum Co., Buffalo, N. Y. (Rock wool)
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa. (Asbestos and magnesia)
North American Asbestos Corp., Chicago, Ill.
Owens-Corning Fiberglas Corp., Toledo, O. (block or board)
Pacific Lumber Co., The, San Francisco, Calif.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plibrico Co., Chicago, Ill.
Poe Co., C. W., Cleveland, O. (mineral wool)
Quigley Co., Inc., New York, N. Y.
Rector Mineral Trading Corp., New York, N. Y.
Reflectal Corp. Subsidiary, Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Blanket, block, cement)
Robinson Industries, Coleman, Mich. (expanded plastic)
Ruberoid Co., New York, N. Y. (Asbestos, calsilite)
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O. (asbestos)
Smith & Kanzler Corp., Linden, N. J.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
Thermo-Sound Products, Div. of Kittell-Lacy, Inc., El Monte, Calif.
United Cork Co., Kearney, N. J. (Cork)
United States Mineral Wool Co., Stanhope, N. J. (loose wool)
Walker Jamar Co., Duluth, Minn.
Zonolite Co., Chicago, Ill. (plastic)

INSULATION, BUILDING

Acme Asbestos Covering & Flooring Co., Chicago, Ill. (Rock wool)
Alumiseal Corp., New York, N. Y. (reflective)
American Flange & Mfg. Co., Inc., New York, N. Y. (Metal sheets)
Armstrong Cork Co., Lancaster, Pa. (Corkboard, fibre board, rigid foamed plastic board)
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J. (spun mineral wool blankets)
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (Rock wool loose, batts)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Rock wool)
Carney Co., Inc., The, Mankato, Minn.
Celotex Corp., The, Chicago, Ill. (flexible, semi-rigid, and rigid)
Chamberlin Co. of America, Detroit, Mich.
Dow Chemical Co., The, Midland, Mich.
Eagle-Picher Co., Cincinnati, O. (Loose, fill, batt and granulated)
Flintkote Co., The, New York, N. Y.
Forty-Eight Insulations, Inc., Aurora, Ill.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Infra Insulation, Inc., New York, N. Y. (reflective accordion, also asbestos)
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn. (wood fibre)
International Vermiculite Co., Girard, Ill. (Loose fill)
Johns-Manville, New York, N. Y.
Johnston Foil Mfg. Co., St. Louis, Mo. (Foil, aluminum, tin, lead)
L.O.F. Glass Fibers Co., Toledo, O.
Lockport Mills, Inc., Lockport, N. Y.
Mearlcrete Div., Mearl Mfg. Corp., New York, N. Y. (roof fill, floor fill, perimeter)
Minnesota & Ontario Paper Co., Minneapolis, Minn.
Miracle Adhesives Corp., Bellmore, N. Y. (vapor barrier material and insulation)
Multi-Cell Sales Corp., Minneapolis, Minn. (Blanket, quilted newspaper)
Munn & Steele, Inc., South Boston, Mass.
National Cork Co., Englewood, N. J. (Corkboard)
National Gypsum Co., Buffalo, N. Y.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
North American Asbestos Corp., Chicago, Ill.
Owens-Corning Fiberglas Corp., Toledo, O. (batts or blankets)
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plastergon Wall Board Co., Buffalo, N. Y. (Rigid board)
Poe Co., C. W., Cleveland, O. (mineral wool)
Rector Mineral Trading Corp., New York, N. Y.
Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Rock, slag wool)
Revere Copper & Brass, Inc., Standard Rolling Mills Div., Brooklyn, N. Y. (foil)
Reynolds Metals Co., Louisville, Ky.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Ruberoid Co., New York, N. Y.
Schlegel Mfg. Co., Rochester, N. Y. (for weather-stripping doors & windows)
Silvercote Products, Inc., Chicago, Ill.
Sprayo-Flake Co., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill. (Asbestos, hairfelt)
Tennessee Products and Chemical Corp., Nashville, Tenn.
United Cork Companies, Kearny, N. J. (Cork)
United States Gypsum Co., Chicago, Ill. (Wool and USG Ins. board)
United States Mineral Wool Co., Stanhope, N. J. (Mineral wool, granulated wool, loose wool)
United States Pipe & Foundry Co., Birmingham, Ala. (mineral wool-batts and pellets)
Wilson & Co., Inc., Chicago, Ill. (Board)
Wood Conversion Co., St. Paul, Minn.
Zonolite Co., Chicago, Ill. (Loose fill)

INSULATION, DUCT, SOUND DEADENING

For Application Inside Duct

American Hair & Felt Co., Chicago, Ill.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J.
Celotex Corp., The, Chicago, Ill.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Felters Company, The, Boston, Mass.
Grant Wilson, Inc., Chicago, Ill.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Industrial Acoustics Co., Inc., New York, N. Y. (packaged sound trap to incorporate in ductwork for quieting air noise)
Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md. (packaged sound trap to incorporate in ductwork for quieting air noise)
Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn. (wood fibre)
Inter-Coastal Paint Corp., East St. Louis, Ill.
Johns-Manville, New York, N. Y. (mineral wool)
Koppers Co., Inc., Metal Products Div., Baltimore, Md. (sound trap installed in ducts)
L.O.F. Glass Fibers Co., Toledo, O.
Lockport Mills, Inc., Lockport, N. Y.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Mortell Co., J. W., Kankakee, Ill.
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.

Owens-Corning Fiberglas Corp., Toledo, O. (flexible or board)
Silvercote Products, Inc., Chicago, Ill.
Sprayo-Flake Co., Chicago, Ill.
Thompson and Co., Oakmont, Pa.
United States Rubber Co., New York, N. Y.
Wood Conversion Co., St. Paul, Minn.
Zonolite Co., Chicago, Ill.

INSULATION, DUCT, THERMAL

Acme Asbestos Covering & Flooring Co., Chicago, Ill. (Asbestos)
American Flange & Mfg. Co., Inc., New York, N. Y.
American Hair & Felt Co., Chicago, Ill. (Hair felt)
Armstrong Cork Co., Lancaster, Pa. (Corkboard)
Asbestos Asphalt Insulation Co., Chicago, Ill.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J. (semi-rigid mineral wool)
Bigelow Liptak Corp., Detroit, Mich.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asbestos)
Celotex Corp., The, Chicago, Ill.
Dow Chemical Co., The, Midland, Mich.
Eagle-Picher Co., Cincinnati, O. (Mineral wool blankets)
Ehret Magnesia Mfg. Co., Valley Forge, Pa. (Cork, magnesia, hair felt)
Felters Company, The, Boston, Mass. (Wool felt)
Flintkote Co., The, New York, N. Y. (fibrated, asphalt spray on)
Forty-Eight Insulations, Inc., Aurora, Ill.
Grant Wilson, Inc., Chicago, Ill.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Hinde & Dauch Paper Co., Sandusky, O.
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa. (aluminum)
Infra Insulation, Inc., New York, N. Y.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn. (Wood fibre)
Insul-Mastic Corp. of America, Summit, Ill.
International Vermiculite Co., Girard, Ill. (Block)
Johns-Manville, New York, N. Y. (Mineral wool)
Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
Keasbey & Mattison Co., Ambler, Pa. (Asbestos)
L.O.F. Glass Fibers Co., Toledo, O.
Lockport Mills, Inc., Lockport, N. Y.
Lynch Asbestos Co., Los Angeles, Calif. (asbestos & foil aircells)
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Miracle Adhesives Corp., Bellmore, N. Y. (prefabricated polyvinyl duct covering)
Mortell Co., J. W., Kankakee, Ill.
Mundet Cork Corp., North Bergen, N. J. (Cork)
Munn and Steele, Inc., South Boston, Mass.
National Cork Co., Englewood, N. J. (Corkboard)
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa. (Asbestos and wool felt)
Owens-Corning Fiberglas Corp., Toledo, O. (Blanket or board)
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Poe Co., C. W., Cleveland, O. (mineral wool)
Quigley Co., Inc., New York, N. Y.
Rector Mineral Trading Corp., New York, N. Y.
Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Mineral wool blanket)
Reynolds Metals Co., Louisville, Ky.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Ruberoid Co., New York, N. Y. (Asbestos cellular and laminated sheets or blocks)
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O.
Silvercote Products, Inc., Chicago, Ill.
Smith & Kanzler Corp., Linden, N. J. (Asbestos air cell type)
Sprayo-Flake Co., Chicago, Ill.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill. (Asbestos, hair felt)
Thermo-Sound Products, Div. of Kittell-Lacy, Inc., El Monte, Calif. (blanket type)
United Cork Companies, Kearny, N. J. (Cork)
United States Mineral Wool Co., Stanhope, N. J.
Wilson & Co., Inc., Chicago, Ill.
Wood Conversion Co., St. Paul, Minn.

INSULATION FASTENERS AND ANCHORS

See Fasteners, Insulation

INSULATION, FINISHING CEMENT

Baldwin-Hill Co., Trenton, N. J.
Bigelow Liptak Corp., Detroit, Mich.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Eagle-Picher Co., Cincinnati, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa. (magnesia)
Forty-Eight Insulations, Inc., Aurora, Ill.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Moore Inc., Goodloe E., Danville, Ill.
Mundet Cork Corp., N. Bergen, N. J. (mineral wool)
North American Asbestos Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y.
Ruberoid Co., New York, N. Y. (asbestos)
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O. (asbestos)
St. Clair Rubber Co., Detroit, Mich.
Standard Asbestos Mfg. Co., Chicago, Ill.

INSULATION, PIPE, AND TUBING

Acme Asbestos Covering & Flooring Co., Chicago, Ill. (magnesia)
American Gilsonite Co., Salt Lake City, Utah (hot, underground)
American Hair & Felt Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa. (Cork, flexible foamed plastic)
Asbestos Asphalt Insulation Co., Chicago, Ill.
Atlas Mineral Products Co., Mertztown, Pa.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J. (mineral wool; #100 pipe covering, 85% magnesia pipe covering, calcium silicate pipe covering)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asbestos, magnesia)
Dow Chemical Co., The, Midland, Mich.
Durant Insulated Pipe Co., Palo Alto, Calif. (Underground)
Durant Insulated Pipe Co., Inc., Williamstown, N. J. (underground)
Eagle-Picher Co., Cincinnati, O. (Mineral wool)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Fibreboard Paper Products Corp., San Francisco, Calif.
Forty-Eight Insulations, Inc., Aurora, Ill.
Grant Wilson, Inc., Chicago, Ill. (85% magnesium, air-cell, woolfelt, anti-sweat, frost proof, sponge felt.)
Gustin-Bacon Mfg. Co., Kansas City, Mo. (Molded fine glass fiber)
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa. (reflective)
Industrial Laminates Div., Fabric Distributing Co., New York, N. Y.
Infra Insulation, Inc., New York, N. Y.
Insul-Mastic Corp. of America, Summit, Ill. (asphalt-cork)
International Vermiculite Co., Girard, Ill.
Jarrow Products, Inc., Chicago, Ill. (sponge tubing)
Johns-Manville, New York, N. Y.
Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
Keasbey Co., Robert A., New York, N. Y. (Asbestos and cork) (hair felt on cold side)
Keasbey & Mattison Co., Ambler, Pa. (Asbestos, magnesia)
L.O.F. Glass Fibers Co., Toledo, O.
Lockport Mills, Inc., Lockport, N. Y.
M M M, Inc., Houston, Tex. (low temperature)
Mearlcrete Div., Mearl Mfg. Corp., New York, N. Y. (underground pipe)
Minnesota Mining & Mfg. Co., St. Paul, Minn. (Spray)
Miracle Adhesives Corp., Bellmore, N. Y. (prefabricated polyvinyl pipe insulation and finish)
Mortell Co., J. W., Kankakee, Ill. (plastic cork)
Mundet Cork Corp., North Bergen, N. J. (85% magnesia, 100% pure cork)
Munn and Steele, Inc., South Boston, Mass.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
National Cork Co., Englewood, N. J. (Corkboard)
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa. (Asbestos, magnesia)
North American Asbestos Corp., Chicago, Ill.
Owens-Corning Fiberglas Corp., Toledo, O. (performer or flexible)
Pacific States Felt Mfg. Co., Inc., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa. (cellular glass)
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Poe Co., C. W., Cleveland, O. (mineral wool)
Porter & Co., Inc., H. W., Newark, N. J. (Underground)
Presstite-Keystone Engineering Products Co., A Div. of American-Marietta Co., St. Louis, Mo. (tape)
Rector Mineral Trading Corp., New York, N. Y.
Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill (foil and corrugated paper)
Rhopac, Inc., Skokie, Ill.
Ric-wiL, Inc., Barberton, O. (hot or cold)
Robinson Industries, Coleman, Mich. (expanded plastic)
Rubatex Div., Great American Industries, Inc., Bedford, Va. (rubber)
Ruberoid Co., New York, N. Y. (Asbestos, calsilite)
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O. (asbestos)
Smith & Kanzler Corp., Linden, N. J. (Asbestos air cell, wool felt and hair felt)
Sponge Products Div., B. F. Goodrich Co., Shelton, Conn.
Spring Packing Corp., Chicago, Ill. (asphaltic)
Standard Asbestos Mfg. Co., Chicago, Ill.
Surface Chemicals, Inc., McKees Rock, Pa.
United Cork Companies, Kearny, N. J.
Walker Jamar Co., Duluth, Minn.
Wilson & Co., Chicago, Ill. (hairfelt)
Wood Conversion Co., St. Paul, Minn.
Wrap-On Co., Chicago, Ill. (Glass fiber and flexible tape)
Ziegler & Co., G. S., Great Neck, N. Y.
Zonolite Co., Chicago, Ill. (underground)

INTAKES FOR OUTDOOR AIR, WALL OR ROOF, EQUIPPED WITH FILTERS

Atmos Corp., Chicago, Ill.

IONIZATION APPARATUS

Dryomatic Corp., Alexandria, Va.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Illinois Water Treatment Co., Rockford, Ill. (also for de-ionization)
Ionaire, Inc., San Francisco, Calif.
Montgomery Bros., San Francisco, Calif.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.
Wesix Electric Heater Co., San Francisco, Calif.

IRON BODY VALVES

See Valves, Gate; and Valves, Globe

ISOTOPES, RADIOACTIVE, FOR DETECTING LEAKS IN PIPING AND HEATING SYSTEMS

Tracerlab, Inc., Boston, Mass.

JACKETED PIPE

See Pipe, Jacketed

JACKETING FOR PIPE INSULATION

See Protectors, Pipe Covering

JETS, OVERFIRE AIR, FOR SMOKE ABATEMENT

Canton Stoker Corp., Canton, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
McNeill Smoke Eliminator Co., Chicago, Ill.
North American Mfg. Co., Cleveland, O.
Power Engineering Co., Chicago, Ill.
Sterns-Flinn Corp., New York, N. Y.

JOINTS, PIPE, ELECTRICAL INSULATING

Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Universal Controls Corp., Dallas, Tex.

JOINTS, PIPE, EXPANSION, FOR BASEBOARD HEATING

Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Flexonics Corp., Maywood, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Northern Indiana Brass Co., Elkhart, Ind.
Webster & Co., Warren, Camden, N. J.

JOINTS, PIPE, EXPANSION, PACKLESS, METAL

American Boa, Inc., New York, N. Y.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
American Flow Control Corp., Houston, Tex.
Badger Fire Extinguisher Co., Methuen, Mass.
Badger Mfg. Co., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexonics Corp., Maywood, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Harris & Co., Arthur, Chicago, Ill.
Kopperman & Sons, Joseph, Philadelphia, Pa.
Marquette Coppersmithing Co., Philadelphia, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa.
Ric-wiL, Inc., Barberton, O.
Rotherm Engineering Co., Inc., Chicago, Ill.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Solar Aircraft Co., San Diego, Calif.
Techniflex Corp., Port Jervis, N. Y.
Zallea Brothers, Wilmington, Del.

JOINTS, PIPE, EXPANSION, PACKLESS, RUBBER

American Flow Control Corp., Houston, Tex.
Garlock Packing Co., Palmyra, N. Y. (spool type & U type)
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
United States Rubber Co., New York, N. Y.
Vibration Mountings, Inc., Corona, Ill.

JOINTS, PIPE, EXPANSION, SLIP

American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
American Flow Control Corp., Houston, Tex.
Badger Fire Extinguisher Co., Methuen, Mass.
Baker & Co., R. H., Huntington Park, Calif.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Heating Equipment Co., Detroit, Mich.
Moran Flexible Joint Co., Div. of Railroad Products Co., Cincinnati, O.
Multiplex Mfg. Co., Berwick, Pa.
Northern Indiana Brass Co., Elkhart, Ind.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Powell Co., Wm., Cincinnati, O.
Q-P Mfg. Co., Needham Heights, Mass.
Royalton Co., Inc., Gasport, N. Y.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Tube Turns Plastics, Inc., Louisville, Ky. (injection molded PVC)
United States Gasket Co., Camden, N. J.
Walworth Co., New York, N. Y.
Webster & Co., Warren, Camden, N. J.
Yarnall-Waring Co., Philadelphia, Pa.

JOINTS, PIPE, FLEXIBLE, SWING AND REVOLVING

Barco Mfg. Co., Barrington, Ill.
Bordo Co., Inc., L. J., Glenside, Pa.
Chiksan Co., Brea, Calif.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexo Supply Co., Inc., St. Louis, Mo.
Johnson Corp., The, Three Rivers, Mich.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Mayson Mfg. Co., Detroit, Mich.
Moran Flexible Joint Co., Div. of Railroad Products Co., Cincinnati, O.
OPW Corp., Cincinnati, O.
Perfecting Service Co., Charlotte, N. C.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Powell Co., Wm., Cincinnati, O.
Rotherm Engineering Co., Inc., Chicago, Ill.
Seamlex Co., Inc., Long Island City, N. Y.
Spincraft, Inc., Milwaukee, Wis.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

JOINTS, UNIVERSAL, FOR OPERATING VALVES

Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich.
Brooks Equipment Corp., Hoboken, N. J.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Piezo Mfg. Corp., Staten Island, N. Y.
Stow Mfg. Co., Binghamton, N. Y.

KATA THERMOMETERS

See Thermometers, Kata

KITS, COMBUSTION TESTING

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
G. M. Mfg. Co., New York, N. Y.
Hays Corp., Michigan City, Ind.
Victory Engineering Corp., Union, N. J.

LACQUERS

See Enamels and Lacquers

LAGGING ADHESIVES

See Adhesives, for Pipe Covering

LAMPS, STERILIZING, FOR DUCT INSTALLATION

Cooper Hewitt Electric Co., Hoboken, N. J.
Fuller Co., D. William, Chicago, Ill.
General Electric Co., Large Lamp Dept., Nela Park, Cleveland, O.
Hanovia Chemical & Mfg. Co., Newark, N. J.
Sampson Chemical & Pigment Corp., Chicago, Ill.
Sperti, Faraday, Inc., Hoboken, N. J.
Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.

LEAD PIPE

See Pipe and Tubing, Lead and Lead Alloy

LEAD SHEETS

See Sheets, Lead

LEAD TUBING

See Pipe and Tubing, Lead and Lead Alloy

LEAK DETECTORS

See Detectors, Leak, Refrigerant; Detectors, Leak, Underground Piping; Isotopes, Radioactive

LEATHER PACKING

See Packing, Leather

LIFT GATES AND LIFT TRUCKS

See Gates, Lift; Trucks, Lift

LIGHTS, PILOT AND SIGNAL

Benjamin Electric Mfg. Co., Des Plaines, Ill.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
General Electric Co., Large Lamp Dept., Nela Park, Cleveland, O.
Hart Mfg. Co., The, Hartford, Conn.
Hubbell Corp., Mundelein, Ill. (for solenoid valves)
Kulka Electric Mfg. Co., Inc., Mt. Vernon, N. Y.
Pyle-National Co., The, Chicago, Ill.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Signal Indicator Corp., Brooklyn, N. Y.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Westinghouse Electric Corp., Pittsburgh, Pa.

LININGS, TANK

Amercoat Corp., South Gate, Calif.
Atlas Mineral Products Co., Mertztown, Pa.
Carboline Co., The, St. Louis, Mo.
Corite Products, Inc., Chicago, Ill. (plastic)
Corrosion Control Co., Inc., New York, N. Y.
Elastic Porcelain Lining Corp., Rochester, N. Y.
Garlock Packing Co., Palmyra, N. Y.
Gates Engineering Co., Wilmington, Del.
Goodrich Industrial Products Co., B. F., Akron, O.
Heil Process Equipment Corp., Cleveland, O.
Heresite & Chemical Co., Manitowoc, Wis. (Phenolic and sheet rubber coatings)
Industrial Filter & Pump Co., Chicago, Ill.
Kaykor Industries, Inc., Yardville, N. J.
Knight, Maurice A., Akron, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lithcote Corp., Melrose Park, Ill.
Norwood Associated Engineers, Inc., Springfield, Mass.
Novelty Steam Boiler Wks., Inc., Baltimore, Md.
Patterson-Kelley Co., Inc., The, E. Stroudsburg, Pa. (cement)
Porce-Lin Tank Lining Co., Detroit, Mich.
Steelcote Mfg. Co., St. Louis, Mo.
United States Rubber Co., New York, N. Y.
Wilbur & Williams Co., Brighton, Mass. (acid caustic band tank lining system)

LINKS, FUSIBLE

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Register Corp., Cedar Grove, N. J.
Grinnell Co., Inc., Providence, R. I.
Morse-Smith-Morse Co., Watertown, Mass.
Preferred Utilities Mfg. Corp., New York, N. Y.

LIQUID LEVEL GAGES

See Gages, Liquid Level

LIQUID LEVEL INDICATORS

See Indicators, Liquid Level

LIQUID LEVEL RECORDERS

See Recorders, Liquid Level

LIQUID LEVEL REGULATORS

See Regulators, Liquid Level

LIQUID PRESSURE REGULATORS

See Regulators, Pressure, Liquid

LOCATORS, PIPE, UNDERGROUND

Fisher Research Laboratory, Inc., Palo Alto, Calif.
Globe Phone Mfg. Co., Reading, Mass.
Wilkinson Products Co., Pasadena, Calif.

LOCK FORMING MACHINES

See Machines, Pittsburgh Lock Forming

LOCK NUTS

See Nuts, Lock

LOUVERS AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

Acme Equipment Co., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.

Air Conditioning Engineering Co., Cambridge, Mass.
Air Conditioning Products Co., Detroit, Mich.
Airjet Ventilator Co., San Clemente, Calif.
Airmaster Corp., Chicago, Ill.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Coolair Corp., Jacksonville, Fla.
American Foundry & Furnace Co., Bloomington, Ill.
American Metal Works, Inc., New Orleans, La.
American Steel Band Co., Pittsburgh, Pa.
American Warming & Ventilating Co., Toledo, O.
Ammerman Co., Inc., Minneapolis, Minn.
Arex Co., Chicago, Ill.
Atmos Corp., Chicago, Ill.
Belco Industries, Inc., St. Louis, Mo.
Biersach & Niedermeyer Co., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Brisk Metal Products, New York, N. Y.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Burt Mfg. Co., Akron, O.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Colt Ventilation Co. of America, Inc., Los Angeles, Calif.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Detroit Float & Stamping Co., Detroit, Mich.
Dual-Air Fan Co., Hampshire, Ill.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Elgo Shutter & Mfg. Co., Detroit, Mich.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Frigid, Inc., Brooklyn, N. Y.
General Blower Co., Morton Grove, Ill.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
Imperial Damper Co., New York, N. Y.
Independent Register Co., Cleveland, O.
International Engineering, Inc., Dayton, O.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Lemlar Mfg. Co., Gardena, Calif.
Martin Fan & Blower Co., Chicago, Ill.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Muckle Mfg. Co., Owatonna, Minn.
Murray Co. of Texas, The, Atlanta, Ga.
Peerless Electric Co., Warren, O.
Reed Unit-Fans, Inc., New Orleans, La.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Rittling Corp., The, Buffalo, N. Y.
Robertson Co., H. H., Pittsburgh, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Sioux Steel Co., Sioux Falls, S. D.
Standard Stamping & Perforating Co., Chicago, Ill.
Swartwout Co., The, Cleveland, O.
Thermotank, Inc., Products Div., Detroit, Mich.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United Sheet Metal Co., Inc., Columbus, O.
United States Gypsum Co., Chicago, Ill.
United States Register Co., Battle Creek, Mich.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

LOUVERS, SUN REFLECTING

American Warming & Ventilating Co., Toledo, O.
Atmos Corp., Chicago, Ill.
Lemlar Mfg. Co., Gardena, Calif.

LOW WATER CUT-OFFS

See Cut-offs, Low Water, Heating Boiler

LUBRICANTS, VALVE STEM

Electrofilm, Inc., N. Hollywood, Calif.
Fluidwick Co., Detroit, Mich.
Gulf Oil Corp., Pittsburgh, Pa.
Jet-Lube, Inc., Burbank, Calif.

MACHINES, BALANCING

See Equipment, Balancing

MACHINES, BLUE PRINT AND WHITE PRINT

For Reproducing Engineering Drawings

American Photocopy Equipment Co., Chicago, Ill. (for photocopy work)
Bruning Co., Inc., Charles, Chicago, Ill.
Dietzgen Co., Eugene, Chicago, Ill.
Ozalid Div. of General Aniline & Film Corp., Johnson City, N. Y.
Paragon-Revolute Corp., Rochester, N. Y.
Pease Co., C. F., The, Chicago, Ill.

MACHINES AND FILM, X-RAY

Balteau Electric Corp., Stamford, Conn.
du Pont de Nemours & Co., E. I., Photo Products Dept., Wilmington, Del. (film only)
Eastman Kodak Co., Rochester, N. Y.
Keleket X-Ray Corp., Covington, Ky.
Metal & Thermit Corp., Rahway, N. J. (radiographic)
Mitchell Radiation Products Corp., Norristown, Pa.
North American Philips Co., Inc., Mt. Vernon, N. Y.
Picker X-Ray Co., White Plains, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.

MACHINES, FLARING, PIPE AND TUBE

Chicago Pneumatic Tool Co., New York, N. Y.
Leonard Precision Products Co., Santa Ana, Calif.
Springload Mfg. Corp., Seattle, Wash. (Tenoning)
Wilson Co., K. R., Arcade, N. Y.

MACHINES, PIPE CLEANING

Continental Machine Co., Chicago, Ill.
Fennelly Co., J. C., San Francisco, Calif.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Spartan Tool Co., Chicago, Ill.
Wilson, Inc., Thomas C., Long Island City, N. Y.

MACHINES, PIPE CUTTING AND THREADING, PORTABLE

Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Collins Machinery Corp., Los Angeles, Calif.
Continental Machine Co., Chicago, Ill.
H & M Pipe Beveling Machine Co., Tulsa, Okla.
Kalamazoo Tank & Silo Co., Machine Tool Div., Kalamazoo, Mich.
Landis Machine Co., Inc., Waynesboro, Pa.
Muncie Gear Wks., Inc., Muncie, Ind.
Obear & Son, W. F., Inglewood, Calif.
Oster Mfg. Co., Cleveland, O.
Ridge Tool Co., Elyria, O.
Thread-Ezy Mfg. Co., Corunna, Mich.
Toledo Pipe Threading Machine Co., Toledo, O.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.
Wachs Co., E. H., The, Chicago, Ill.

MACHINES, PIPE CUTTING AND THREADING, STATIONARY

Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
Collins Machinery Corp., Los Angeles, Calif.
Continental Machine Co., Chicago, Ill.
Landis Machine Co., Inc., Waynesboro, Pa.
Obear & Son, W. F., Inglewood, Calif.
Oster Mfg. Co., Cleveland, O.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Stratford Pipe Scalloper Co., Clearwater, Fla.
Toledo Pipe Threading Machine Co., Toledo, O.

MACHINES, PITTSBURGH LOCK FORMING

Birks Mfg. Co., Meridan, Conn. (Pittsburgh lock seam opener)
Lockformer Co., Chicago, Ill.
Maplewood Machinery Co., Inc., Chicago, Ill.
Milton Equipment Co., Philadelphia, Pa. (sheet metal working machine)
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Speed-Seam Co., Chicago, Ill.

MACHINES, REFRIGERATION, ABSORPTION

Carrier Corp., Syracuse, N. Y.
Servel, Inc., Evansville, Ind.
Worthington Corp., Harrison, N. J.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

MACHINES, SLIP ROLL FORMING

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bertsch & Co., Inc., Cambridge City, Ind.
Hendley & Whitmore Co., Beloit, Wis.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
San Angelo Foundry & Machine Co., San Angelo, Tex.
Webb Corp., The, Webb City, Mo.
Wysong & Miles, Inc., Greensboro, N. C.

MACHINES, TESTING, WELD

Air Reduction Co., Inc., New York, N. Y.
Dillon & Co., Inc., W. C., Van Nuys, Calif.
Olsen Testing Machine Co., Tinius, Willow Grove, Pa.

MACHINES, TRENCHING, FOR PIPE LINES

Auburn Machine Works, Inc., Auburn, Nebr.
Clipper Mfg. Co., Kansas City, Mo.
Parsons Co., Div. of Koehring Co., Newton, Ia.

MACHINES, TUBE FINNING

United Machinery Sales Co., Chicago, Ill.

MAGNESIUM ALLOY SHEETS

See Sheets, Magnesium Alloy

MAGNESIUM TUBING

See Tubing, Magnesium

MALLEABLE UNIONS

See Unions, Malleable

MANIFOLDS AND HEADERS, PREFABRICATED, FOR HEATING SYSTEMS

Acheson Mfg. Co., Rankin, Pa.
Dahl, G. W., Bristol, R. I.
Dunham-Bush, Inc., West Hartford, Conn.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Grinnell Co., Inc., Providence, R. I
Hi-Flow Products, Inc., Copiague, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Shaw-Kendall Engineering Co., Toledo, O.
Super Radiator Corp., Minneapolis, Minn.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.

MANIFOLDS, REFRIGERATION

Frick Co., Waynesboro, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Mueller Brass Co., Port Huron, Mich.
Reco Products Div., Recony Corp., New York, N. Y.
Super Radiator Corp., Minneapolis, Minn.
Superior Valve and Fittings Co., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., Milwaukee, Wis.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

MANOMETERS

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Meter Co., Inc., Philadelphia, Pa.

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Defender Instrument and Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Elgin Softener Corp., Elgin, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Flow Corp., Cambridge, Mass. (micro)
Hastings-Raydist, Inc., Hampton, Va.
Hill & Co., E. Vernon, Lake Geneva, Wis.
King Engineering Corp., Ann Arbor, Mich.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Inst. Labs. Inc., Riverdale, Md.
Norwalk Valve Co., South Norwalk, Conn.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Simplex Valve & Meter Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Wallace & Tiernan Inc., Belleville, N. J.
Will Corp., Rochester, N. Y.

MARKERS, PIPE, HOLE AND SADDLE

Brady Co., W. H., Milwaukee, Wis.
Contour Marker Corp., Compton, Calif.
Jewel Mfg. Co., St. Paul, Minn.

MECHANICAL DRIVE TURBINES

See Turbines, Mechanical Drive

MECHANICAL SPEED CHANGERS

See Changers, Speed, Mechanical

MECHANICAL TRAPS

See Traps, Steam, Mechanical

MERCURY SWITCHES

See Switches, Mercury

METAL HOSE

See Hose, Flexible, Metal and Fittings

METAL, POROUS, FOR FILTRATION, SEPARATION, DIFFUSION AND FLOW CONTROL

Keystone Carbon Co., Inc., St. Marys, Pa.
Moraine Products Div., General Motors Corp., Dayton, O.
Newark Wire Cloth Co., Newark, N. J.
Wabash Corp., Chicago, Ill.

METALLIC BELLOWS

See Bellows, Thermostatic and Metallic

METALLIC PACKING

See Packing, Metallic

METERS, AIR VELOCITY, DIRECT READING

Air Devices, Inc., New York, N. Y.
Anemostat Corp. of America, New York, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Hastings-Raydist, Inc., Hampton, Va.
Illinois Testing Laboratories, Inc., Chicago.

METERS, BTU, FOR MEASURING FLOW AND TEMPERATURE AND CALIBRATED IN BTU OR THERMS

Bailey Meter Co., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Simpson Electric Co., Chicago, Ill.

METERS, CONDENSATE

Central Station Steam Co., Detroit, Mich.
Hays Corp., Michigan City, Ind.
Henszey Co., Watertown, Wis.
Neptune Meter Co., New York, N. Y.

METERS, FLOW, GAS OR AIR

American Meter Co., Inc., Philadelphia, Pa.
Aquatrol Ferr-X Corp., Clifton, N. J.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Dahl, G. W., Bristol, R. I.
Daytronic Corp., Dayton, O.
Defender Instrument & Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Fischer & Porter Co, Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Industrial Development Laboratories, Inc., Jersey City, N. J.
King Engineering Corp., Ann Arbor, Mich.
Librascope, Inc., Commercial Div., Burbank, Calif.
Liquid Carbonic Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Instrument Laboratories, Inc., Riverdale, Md.
Neptune Meter Co., New York, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Selas Corp. of America, Dresher, Pa.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.

METERS, FLOW, REFRIGERANT

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Landsdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Neptune Meter Co., New York, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Trimount Instrument Co., Chicago, Ill.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.

METERS, FLOW, STEAM

American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Henszey Co., Watertown, Wis.
King Engineering Corp., Ann Arbor, Mich.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Instrument Laboratories, Inc., Riverdale, Md.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

METERS, PROCESS LIQUID

American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Buffalo Meter Co., Buffalo, N. Y.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Daytronic Corp., Dayton, O.
Drage Products, Inc., Union City, N. J.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Granberg Corp., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Henszey Co., Watertown, Wis.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Neptune Meter Co., New York, N. Y.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Smith Corp., A. O., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Trimount Instrument Co., Chicago, Ill.
Worthington-Gamon Meter Div., Worthington Corp., Newark, N. J.

METERS, VOLUME, AIR AND GAS

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Meter Co., Inc., Philadelphia, Pa.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Granberg Corp., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Meriam Instrument Co., The, Cleveland, O.
Neptune Meter Co., New York, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Roots-Connersville Blower Div., Connersville, Ind.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Selas Corp. of America, Dresher, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Uehling Instrument Co., Paterson, N. J.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Wallace & Tiernan Inc., Belleville, N. J.

METERS, WATER

American Moistening Co., Providence, R. I.
Aquatrol Ferr-X Corp., Clifton, N. J.
Brooks Rotameter Co., Lansdale, Pa.
Buffalo Meter Co., Buffalo, N. Y.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Henszey Co., Watertown, Wis.
Hersey Mfg. Co., South Boston, Mass.
Neptune Meter Co., New York, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

Worthington Corp., Harrison, N. J.
Worthington-Gamon Meter Div., Worthington Corp., Newark, N. J.

MIXING VALVES

See Valves, Mixing, Steam and Water

MODULATING VALVES

See Valves, Radiator, Steam and Hot Water Modulating

MOTOR BASES

See Bases and Pads, Vibration Isolating; Bases, Motor Tension Adjusting

MOTOR CONTROLLERS

See Controllers and Starters, Motor

MOTOR OPERATED VALVES

See Valves, Motor Operated

MOTOR-PUMP UNITS

See Pump-Motor Units, Self-Contained

MOTOR STARTERS

See Controllers and Starters, Motor

MOTORS, COMPRESSED AIR POWERED

Binks Mfg. Co., Chicago, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Detroit Hoist & Machine Co., Detroit, Mich.
Gardner-Denver Co., Quincy, Ill.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Leiman Bros., Inc., Newark, N. J.

MOTORS, ELECTRIC, FRACTIONAL HP

ACEC Electric Corp., New York, N. Y.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Alliance Mfg. Co., Inc., Alliance, O. (Shaded pole)
Baldor Electric Co., St. Louis, Mo.
Barber-Colman Co., Rockford, Ill.
Bluffton Electric Co., Bluffton, Ind.
Bodine Electric Co., Chicago, Ill.
Brown-Brockmeyer Co., Inc., Dayton, O.
Burke Electric Co., Div. of Marathon Electric Mfg. Corp., Erie, Pa.
Century Electric Co., St. Louis, Mo.
Clock & Timer Dept., General Electric Co., Ashland, Mass.
Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Dayton Electric Mfg. Co., Chicago, Ill.
Delco Products Div., General Motors Corp., Dayton, O.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Doerr Electric Corp., Cedarburg, Wis.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Electric Motor Corp., Div. of Howard Industries, Inc., Racine, Wis.
Electric Motors & Specialties, Inc., Garrett, Ind.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fairbanks, Morse & Co., Chicago, Ill.
Fasco Industries, Inc., Rochester, N. Y.
Franklin Electric Co., Inc., Bluffton, Ind.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hansen Mfg. Co., Inc., Princeton, Ind.
Haywood Industries, Racine, Wis.
Holtzer-Cabot Electric Motor Div., National Pneumatic Co., Inc., Boston, Mass.
Howard Industries, Inc., Racine, Wis. (shaded pole)
Howell Electric Motors Co., Howell, Mich.
Iron Fireman Mfg. Co., Cleveland, O.
Jack & Heintz, Inc., Cleveland, O.
Kingston-Conley, Inc., Div. of the Ohio Electric Mfg. Co., North Plainfield, N. J.
Lamb Electric Co., Kent, O.
Leland Electric Co., The, Div. of American Machine & Foundry Co., Dayton, O.
Lima Electric Motor Co., The, Lima, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marco Industries, Inc., Womelsdorf, Pa.
Master Electric Co., Dayton, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Co., The, Marceline, Mo., (Slow speed fan motors)
Morrill Motors, Ft. Wayne, Ind.
Newman Industries (America) Inc., New York, N. Y.
Ohio Electric Mfg. Co., The, Maple Heights, O.
Packard Electric Div., General Motors Corp., Warren, O.
Peerless Electric Co., Warren, O.
Portable Electric Tools, Inc., Chicago, Ill.
Redmond Co., Inc., Owosso, Mich.
Reynolds Electric Co., River Grove, Ill.
Ripley Co., Inc., Middletown, Conn.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Robbins & Myers, Inc., Springfield, O.
Royal Mfg. Corp., Waterloo, Ind.
Small Motors, Inc., Chicago, Ill.
Smith Corp., A. O., Milwaukee, Wis.
Smith Corp., A. O., Electric Motor Div., Tipp City, O.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago (Cicero), Ill.
Sutton Corp., O. A., The, Wichita, Kans.
Thermador Electrical Mfg., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Universal Electric Co., Owosso, Mich.
Wagner Electric Corp., St. Louis, Mo.
Westinghouse Electric Corp., Pittsburgh, Pa.

MOTORS, ELECTRIC, 1 HP AND OVER

ACEC Electric Corp., New York, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Allis Co., Louis, The, Milwaukee, Wis.
Baldor Electric Co., St. Louis, Mo.
Brook Motor Corp., Chicago, Ill.
Brown-Brockmeyer Co., Inc., Dayton, O.
Burke Electric Co., Div. of Marathon Electric Mfg. Corp., Erie, Pa.
Byron Jackson Pumps, Inc.., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif. (submersible)
Century Electric Co., St. Louis, Mo.
Continental Electric Co., Inc., Newark, N. J.
Dayton Electric Mfg. Co., Chicago, Ill.
Delco Products Div., General Motors Corp., Dayton, O.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Doerr Electric Corp., Cedarburg, Wis.
Electric Machinery Mfg. Co., Minneapolis, Minn. (100 hp and over)
Electric Products Co., Cleveland, O.
Electro-Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Elliott Co., Jeannette, Pa.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fairbanks, Morse & Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hertner Electric Co., The, Cleveland, O.
Howell Electric Motors Co., Howell, Mich.
Ideal Electric & Mfg. Co., Mansfield, O.
Imperial Electric Co., Akron, O.
Kingston-Conley, Inc., Div. of the Ohio Electric Mfg. Co., North Plainfield, N. J.
Leland Electric Co., The, Div. of American Machine & Foundry Co., Dayton, O.
Lima Electric Motor Co., The, Lima, O.
Lincoln Electric Co., Cleveland, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
Master Electric Co., Dayton, O.
Moore Co., The, Marceline, Mo. (Slow speed fan motors).
Newman Industries (America) Inc., New York, N. Y.
Peerless Electric Co., Warren, O.
Reliance Electric & Engineering Co., Cleveland, O.
Reuland Electric Co., Alhambra, Calif.
Robbins & Myers, Inc., Springfield, O.
Smith Corp., A. O., Milwaukee, Wis.
Smith Corp., A. O., Electric Motor Div., Tipp City, O.
Star-Kimble Motor Div., Miehle Printing Press & Mfg. Co., Bloomfield, N. J.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Wagner Electric Corp., St. Louis, Mo.
Westinghouse Electric Corp., Pittsburgh, Pa.

MOUNTINGS, VIBRATION

See Bases and Pads, Vibration Isolating

MUFFLERS, HOT GAS, FOR REFRIGERANT LINES

Dunham-Bush, Inc., West Hartford, Conn.
Industrial Acoustics Co., Inc., New York, N. Y.
McIntire Co., The, Livingston, N. J.

MUSHROOM HEATERS

See Heaters, Steam Jet, for Liquids

MUSHROOM VENTILATORS

See Ventilators, Mushroom

NAMEPLATES, STOCK WORDING FOR IDENTIFYING HEATING, PIPING AND AIR CONDITIONING EQUIPMENT AND CONTROLS

Atlantic Engravers, Inc., Amityville, N. Y.
Metalcraft, Inc., Mason City, Ia.
North Shore Nameplate Inc., Bayside, N. Y.
Seton Name Plate Co., New Haven, Conn.

NEUTRALIZERS, ACID

See Dehydrant and Acid Neutralizer

NEUTRALIZERS, ODOR

See Adsorbers, Odor

NICKEL AND NICKEL ALLOY PIPE AND FITTINGS

See Tubing, Nickel and Alloy; Fittings, Pipe, Nickel and Nickel Alloy; Pipe, Nickel and Nickel Alloy

NICKEL AND NICKEL ALLOY SHEETS

See Sheets, Nickel and Nickel Alloy

NIPPLES, PIPE, BRASS AND COPPER

Acheson Mfg. Co., Rankin, Pa.
Aeroquip, Inc., Van Wert, O.
Allen Mfg. Co., W. D., Chicago, Ill.
American Sanitary Mfg. Co., Abingdon, Ill.
Capitol Mfg. & Supply Co., Columbus, O.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Nipple Mfg. Co., Cicero, Ill.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
G & H Mfg. Co., Philadelphia, Pa.
Gilbert Brass Foundry Co., St. Louis, Mo.
Imperial Brass Mfg. Co., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
Mueller Brass Co., Port Huron, Mich.
New York Brass Foundry, New York, N.Y.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Span Brass Mfg. Co., Otsego, Mich.
Star Tubular Products Co., Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Ware Coupling & Nipple Co., Ware, Mass.
Weatherhead Co., Ft. Wayne Div., Ft. Wayne, Ind.
Wheeling Machine Products Co., Wheeling, W. Va.

NIPPLES, PIPE, FLEXIBLE

Hauck Mfg. Co., Brooklyn, N. Y.
Johnson Metal Hose, Inc., Waterbury, Conn.
Lindy Heaters, Inc., New York, N. Y.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Techniflex Corp., Port Jervis, N. Y.
Tube Turns Plastics, Inc., Louisville, Ky. (PVC)
United States Rubber Co., New York, N. Y. (rubber)

NIPPLES, PIPE, IRON AND STEEL

Aeroquip, Inc., Van Wert, O.
Albert Pipe Supply Co., Brooklyn, N. Y.
Allen Mfg. Co., W. D., Chicago, Ill.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Capitol Mfg. & Supply Co., Columbus, O.
Chicago Nipple Mfg. Co., Cicero, Ill.
Clow & Sons, Inc., James B., Chicago, Ill.

Columbus Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (Stainless steel and alloy only)
Illinois Malleable Iron Co., Chicago, Ill.
Ladish Co., Cudahy, Wis.
Larkin Packer Co., Inc., Waxahachie, Tex.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Star Tubular Products Co., Chicago, Ill.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Ware Coupling & Nipple Co., Ware, Mass.
Wheeling Machine Products Co., Wheeling, W. Va.

NIPPLES, PIPE, NICKEL AND NICKEL ALLOY

Camco Products, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Ladish Co., Cudahy, Wis.
Star Stainless Screw Co., Paterson, N. J.
Walworth Co., New York, N. Y.

NIPPLES, RADIATOR, SLIP AND SCREW

Fanner Mfg. Co., The, Cleveland, O.

NOISE ELIMINATION FOR COOLING TOWERS

Industrial Acoustics Co., Inc., New York, N. Y.
Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Vibration Mountings, Inc., Corona, N. Y.

NOISE ELIMINATORS

See Bases and Pads, Vibration Isolating; Hose, Flexible, Metal and Fittings; Insulation, Duct, Sound Deadening

NOZZLES, ATOMIZING

American Moistening Co., Providence, R. I.
Bahnson Co., Winston-Salem, N. C.
Benjamin Air Rifle Co., St. Louis, Mo.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Boston Machine Works Co., Lynn, Mass.
Carrier Corp., Syracuse, N. Y.
Delavan Mfg. Co., West Des Moines, Ia.
Eddington Metal Specialty Co., Eddington, Pa.
Engineer Co., New York, N. Y.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Parks Cramer Co., Fitchburg, Mass. (Industrial humidifier)
Ross Sprinkler Co., Rosemead, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Supreme Electric Products Corp., Rochester, N. Y.
Water Cooling Corp., New York, N. Y.

NOZZLES, FLOODING

Bahnson Co., Winston-Salem, N. C.
Binks Mfg. Co., Chicago, Ill.
Delavan Mfg. Co., West Des Moines, Ia.
Spraying Systems Co., Bellwood, Ill.
Water Cooling Corp., New York, N. Y.

NOZZLES, FLOW MEASURING

Able Metal Spinning & Stamping Co., Far Rockaway, N. Y.
Bailey Meter Co., Cleveland, O.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I. (open flow, inserts)
Defender Instrument & Regulator Co., Boody, Ill.
Delavan Mfg. Co., West Des Moines, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.

NOZZLES, OIL BURNER

Balloffet Nozzle Co., Inc., Guttenberg, N. J.
Century Engineering Corp., Cedar Rapids, Ia.
Delavan Mfg. Co., West Des Moines, Ia.
Eddington Metal Specialty Co., Eddington, Pa.
Engineer Co., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Steinen Mfg. Co., Wm., Newark, N. J.

NOZZLES, SPARGER, FOR TANK HEATING

Heil Process Equipment Corp., Cleveland, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

NOZZLES, SPRAY

Allen Mfg. Co., W. D., Chicago, Ill.
American Cooling Tower Co., Kansas City, Mo.
American Moistening Co., Providence, R. I.
April Showers Co., Inc., Washington, D. C.
Bahnson Co., Winston-Salem, N. C.
Bayley Blower Co., Milwaukee, Wis.
Benjamin Air Rifle Co., St. Louis, Mo.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., The, Livingston, N. J.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chain Belt Co., Milwaukee, Wis.
Clarage Fan Co., Kalamazoo, Mich.
Delavan Mfg. Co., West Des Moines, Ia.
Duriron Co., Inc., Dayton, O.
Eddington Metal Specialty Co., Eddington, Pa.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Air Conditioning & Refrigeration Cooling Tower Div., Whittier, Calif.
General Ceramics Corp., Keasbey, N. J. (ceramic and plastic)
Gray Co., Inc., Minneapolis, Minn.
Harry Cooling Towers, Inc., New York, N.Y.
Link-Belt Co., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill. (air operated)
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Parks-Cramer Co., Fitchburg, Mass.
Plummer Spray Equipment Co., Napoleon, O.
Pritchard & Co. of Carolina, J. F., Kansas City, Mo.
Rega Mfg. Co., Rochester, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Ross Sprinkler Co., Rosemead, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skinner Irrigation Co., Troy, O.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Stearns Co., N. C., Shreveport, La.
Steinen Mfg. Co., Wm., Newark, N. J.
Supreme Electric Products Corp., Rochester, N. Y.
Thermal Agency, Houston, Tex.
TOT Towers, Inc., Houston, Tex.
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.
Worthington Corp., Harrison, N. J.
Yarnall-Waring Co., Philadelphia, Pa.

NUTS AND WASHERS, LOCK

Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grip Nut Co., South Whitley, Ind.
Harper Co., H. M., Morton Grove, Ill.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
MacLean-Fogg Lock Nut Co., Chicago, Ill.
Moore Inc., Goodloe E., Danville, Ill.
Phoell Mfg. Co., Chicago, Ill.
Republic Steel Corp., Bolt & Nut Div., Cleveland, O.
Rockford Screw Products Co., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
SKF Industries, Inc., Philadelphia, Pa.
Shakeproof Div., Illinois Tool Wks., Elgin, Ill.
Standard Pressed Steel Co., Jenkintown, Pa.
Star Stainless Screw Co., Paterson, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Tinnerman Products, Inc., Cleveland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.

OBSERVATION BOILER PORTS

See Ports, Observations, Boiler

ODOR ADSORBERS

See Filters, Air; Adsorbers, Odor

ODOR NEUTRALIZERS

See Adsorbers, Odor; Compounds, Air Freshening

OIL BURNERS

See Burners, Oil

OIL COOLERS

See Coolers, Oil

OIL, CUTTING, PIPE

Beaver Pipe Tools, Inc., Warren, O.
Blue Seal Chemical Co., Roselle Park, N. J.
Capewell Mfg. Co., Hartford, Conn.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Gulf Oil Corp., Pittsburgh, Pa.
Hercules Chemical Co., Inc., New York, N. Y.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O.
Ridge Tool Co., Elyria, O.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Shell Oil Co., Lubricants Dept., Jackson Heights, Long Island, N. Y.
Standard Oil Co. of California, San Francisco, Calif.
Standard Oil Co. of Indiana, Chicago, Ill.
Suflo, Inc., Elizabeth, N. J.
Texas Co., The, New York, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.
Warren Refining & Chemical Co., The, Cleveland, O.
X Laboratories, Inc., New York, N. Y.

OIL, HEAT TRANSFER

Buxton Mfg. Co., Dover, N. J.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Gulf Oil Corp., Pittsburgh, Pa.
Monsanto Chemical Co., St. Louis, Mo.
Shell Oil Co., Lubricants Dept., Jackson Heights, Long Island, N. Y.
Socony-Mobil Oil Co., Inc., New York, N. Y.
Standard Oil Co. of Indiana, Chicago, Ill.

OIL, REFRIGERATION

Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Gulf Oil Corp., Pittsburgh, Pa.
Illinois Oil Products, Inc., Rock Island, Ill.
Sealed Units Parts Co., Inc., Bronx, N. Y.
Shell Oil Co., Lubricants Dept., Jackson Heights, Long Island, N. Y.
Socony-Mobil Oil Co., Inc., New York, N. Y.
Standard Oil Co. of California, San Francisco, Calif.
Standard Oil Co. of Indiana, Chicago, Ill.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

OIL SEPARATORS

See Separators, Oil

OILERS, FOR REFRIGERATION COMPRESSORS

Nocra Mfg. Co., Div. Chase Brass & Copper Co., Waterbury, Conn.
Refrigeration Devices Co., Nutley, N. J.
Trico Fuse Mfg. Co., Milwaukee, Wis.

OILS, FOR COATING VISCOUS AIR FILTERS

Continental Air Filters Inc., Louisville, Ky.
Gulf Oil Co., Pittsburgh, Pa.
Standard Oil Co. of California, San Francisco, Calif.
Trion, Inc., McKees Rocks, Pa.
Vortox Co., Claremont, Calif.

OPERATORS, DAMPER, DUCT

Ace Instrument Co., Inc., Brooklyn, N. Y.
Arens Controls, Inc., Evanston, Ill.
Atmos Corp., Chicago, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cleveland Fuel Equipment Co., Cleveland, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Consolidated Metal Products Corp., Albany, N. Y.
Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Defender Instrument & Regulator Co., Boody, Ill.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hagan Corp., Pittsburgh, Pa.
Hart & Cooley Mfg. Co., Holland, Mich.
Heat-Timer Corp., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nichols Instruments Co., Baltimore, Md.
Powers Regulator Co., Skokie, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Shallcross Controls, Inc., Milwaukee, Wis.
Taylor Instrument Companies, Rochester, N. Y.
Wa-Trol, Houston, Tex.
Young Regulator Co., Cleveland, O.

OPERATORS, VALVE, HAND OR HYDRAULIC

Ace Instrument Co., Inc., Brooklyn, N. Y.
Arens Controls, Inc., Evanston, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Babbitt Steam Specialty Co., New Bedford, Mass.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cameron Iron Works, Inc., Houston, Tex.
Carter Controls, Inc., Lansing, Ill.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
De Zurik Shower Co., Sartell, Minn.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hanna Engineering Wks., Chicago, Ill.
Heat-Timer Corp., New York, N. Y.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Janette Electric Mfg. Co., Morton Grove, Ill.
Johnson Service Co., Milwaukee, Wis.
Kieley & Mueller, Inc., Middletown, N. Y.
Ledeen Mfg. Co., Los Angeles, Calif.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nichols Instruments Co., Baltimore, Md.
Philadelphia Gear Works, Inc., Philadelphia, Pa. (electric)
Powers Regulator Co., Skokie, Ill.
Shallcross Controls, Inc., Milwaukee, Wis.
Sparks-Withington Co., Jackson, Mich.
Techniflex Corp., Port Jervis, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Weighing & Control Components, Inc., Hatboro, Pa.

ORIFICE FLANGES

See Flanges, Orifice

ORIFICE UNIONS

See Unions, Orifice

ORIFICES, FLOW MEASURING

American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Dole Valve Co., The, Morton Grove, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Madden Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Phoenix Products Co., Milwaukee, Wis. (spun metal)
Simplex Valve & Meter Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

ORIFICES, RADIATOR

Au-Temp-Co Corp., New York, N. Y.
Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.

OVERFIRE AIR JETS

See Jets, Overfire Air, for Smoke Abatement

OVER-PRESSURE UNLOADERS, FOR REFRIGERANTS

Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Hubbell Corp., Mundelein, Ill.

OXY-ACETYLENE WELDING

See Welding and Cutting Apparatus, Oxy-Acetylene

OXYGEN PIPING AND REGULATING SYSTEMS

Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
National Cylinder Gas Co., Chicago, Ill.
Oxygen Equipment & Service Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.

OZONE APPARATUS

Michael Electric Co., Inc., New Haven, Conn.
Montgomery Bros., San Francisco, Calif.
Norwood Associated Engineers Inc., Springfield, Mass.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

PACKAGED HEAT PUMP UNITS

See Unit, Air Conditioning, Reverse Refrigeration Cycle

PACKAGED STEAM GENERATORS

See Boilers, Packaged Units, Heating and Process

PACKING, ASBESTOS

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (insulating panel for housing)
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Crane Packing Co., Morton Grove, Ill.
Darcoid Co., Inc., New York, N. Y.
Durabla Mfg. Co., New York, N. Y.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gatke Corp., Chicago, Ill.
Goodall Rubber Co., Trenton, N. J.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Grant Wilson, Inc., Chicago, Ill.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Linear Incorporated, Philadelphia, Pa.
Metallo Gasket Co., New Brunswick, N. J.
New York Belting & Packing Co., Passaic, N. J.
North American Asbestos Corp., Chicago, Ill.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
United States Rubber Co., New York, N. Y.
Western Felt Works, Chicago, Ill.
Zimmerman Packing Co., Cincinnati, O.

PACKING, FIBER

Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Armstrong Cork Co., Lancaster, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chesterton Co., A. W., Everett, Mass.
Crane Packing Co., Morton Grove, Ill.
Darcoid Co., Inc., New York, N. Y.
Durabla Mfg. Co., New York, N. Y.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Goodall Rubber Co., Trenton, N. J.
Greene, Tweed & Co., North Wales, Pa.
Hinde & Dauch Paper Co., Sandusky, O.
Johns-Manville, New York, N. Y.
Linear Incorporated, Philadelphia, Pa.
Metallo Gasket Co., New Brunswick, N. J.
New York Belting & Packing Co., Passaic, N. J.
North American Asbestos Corp., Chicago, Ill.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Products Research Co., Los Angeles, Calif.
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
United States Rubber Co., New York, N. Y.
Zimmerman Packing Co., Cincinnati, O.

PACKING, LEATHER

Alexander Bros., Philadelphia, Pa.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Excelsior Leather Washer Mfg. Co., Rockford, Ill.
Garlock Packing Co., Palmyra, N. Y.
Graton & Knight Co., Inc., Worcester, Mass.
Houghton & Co., E. F., Philadelphia, Pa.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Rhoads & Sons, J. E., Wilmington, Del.
Schieren Co., Chas. A., New York, N. Y.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh,

Pa.
Williams & Son, I. B., Dover, N. H.
Zimmerman Packing Co., Cincinnati, O.

PACKING, METALLIC

Abbott & Biddle Co., Philadelphia, Pa.
Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Conneaut Plastic Metallic Packing Co., Conneaut, O.
Crane Packing Co., Morton Grove, Ill.
Darcoid Co., Inc., New York, N. Y.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Johnston Foil Mfg. Co., St. Louis, Mo.
Linear Incorporated, Philadelphia, Pa.
National Engineering Products Inc., Washington, D. C.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Sims Pump Valve Co., Hoboken, N. J.
United States Rubber Co., New York, N. Y.
Zimmerman Packing Co., Cincinnati, O.

PACKING, RUBBER AND SYNTHETIC

Allpax Co., Inc., Mamaroneck, N. Y.
American Felt Co., Glenville, Conn.
Anchor Packing Co., Philadelphia, Pa.
Armstrong Cork Co., Lancaster, Pa.
Baker & Co., R. H., Huntington Park, Calif.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Chesterton Co., A. W., Everett, Mass.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Chicago Gasket Co., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Continental Rubber Wks., Erie, Pa.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Dow Corning Corp., Midland, Mich.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gates Rubber Co., Denver, Colo.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Greene, Tweed & Co., North Wales, Pa.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins, Inc., Stamford, Conn.
Houghton & Co., E. F., Philadelphia, Pa.
Johns-Manville, New York, N. Y.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Linear Incorporated, Philadelphia, Pa. (semi-metallic, non-metallic)
Minnesota Rubber & Gasket Co., Minneapolis, Minn.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Parker Appliance Co., The, Cleveland, O.
Products Research Co., Los Angeles, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Saran Lined Pipe Co., Ferndale, Mich. (saran rubber)
Thermoid Co., Trenton, N. J.
United States Gasket Co., Camden, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
Xylos Rubber Co., Akron, O.
Zimmerman Packing Co., Cincinnati, O.

PAINT, HIGH TEMPERATURE, FOR HOT SURFACES

Arco Co., The, Cleveland, O.
Babbitt Chemical Co., New Bedford, Mass.
Barreled Sunlight Paint Co., Providence, R. I. (heat resistant aluminum)
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Chemical Solvent Co., Birmingham, Ala.
Claronex Products, Inc., Brooklyn, N. Y.
Continental Products Co., Euclid, O.
Corrosion Control Co., Inc., New York, N. Y.
Debevoise Co., The, Brooklyn, N. Y.
Dixon Crucible Co., Joseph, Jersey City, N. J.
du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Foster Co., Benjamin, Philadelphia, Pa.
General Paint Corp., San Francisco, Calif.
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Illinois Bronze Powder Co., Chicago, Ill.
Kellogg Co., M. W., The, New York, N. Y.
Koppers Company, Inc., Pittsburgh, Pa.
London Chemical Co., Melrose Park, Ill.
Metal & Thermit Corp., Rahway, N. J.
Midland Paint & Varnish Co., Cleveland, O.
National Pipe Coatings, Inc., Huntington Park, Calif.
Nebel Mfg. Co., Cleveland, O.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Quigley Co., Inc., New York, N. Y.
Randolph-Page, Inc., New York, N. Y. (for radiators)
S.O.S. Products Co., Inc., Brooklyn, N. Y.
Sandstrom Products Co., Port Byron, Ill.
Sherwin-Williams Co., The, Cleveland, O.
Speco, Inc., Cleveland, O.
Steelcote Mfg. Co., St. Louis, Mo.
Thompson and Co., Oakmont, Pa.
Tropical Paint Co., Cleveland, O.
Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich.
Valdura Div., American-Marietta Co., Chicago, Ill.
Vimasco Corp., Nitro, W. Va.
Warren Refining & Chemical Co., The, Cleveland, O.
Wilbur & Williams Co., Brighton, Mass.

PANEL BOARDS

See Boards, Panel and Control

PANEL HEATING AND COOLING

See Coils and Panels, Radiant Heating and Cooling; Conductors and Panels, Electrical, for Radiant Heating

PANELS, WINDOW, FOR AIR AIR DIFFUSION

Diamond Mfg. Co., Wyoming, Pa.
Harrington & King Perforating Co., Inc., Chicago.
Mahon Co., R. C., The, Detroit, Mich.
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Simplex Ceiling Corp., New York, N. Y.
Wakefield Co., The, Vermilion, O.

PANELS, WINDOW, FOR AIR CONDITIONERS

Russell Co., F. C., The, Cleveland, Ohio
Southern Plastics Co., Columbia, S. C.

PARTS FOR HEATING AND AIR CONDITIONING EQUIPMENT

Ackermann Mfg. Co., Wheeling, W. Va.
Adams Co., The, Dubuque, Iowa
Air & Refrigeration Corp., New York, N. Y. (factory insulated panels)
Atlas Mfg. Co., St. Paul, Minn. (boiler jackets, furnace cabinets, air conditioning cabinets)
Berger Div., Republic Steel Corp., Canton, O. (cabinets, housings, canopies)
By-Buk Co., Los Angeles, Calif. (pressure sensitive corner pads for preventing surface scratches)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Cincinnati Metalcrafts Inc., Cincinnati, O. (sheet metal fabricating)
Commercial Shearing & Stamping Co., Youngstown, O.
Detroit Stamping Co., Detroit, Mich.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y. (hardware and parts used in fabricating dampers and turning vanes)
Eaton Mfg. Co., Foundry Div., Vassar, Mich. (gray iron castings for air conditioning equipment)
Falstrom Co., Passaic, N. J. (Air conditioning cabinets, steel control panels)
Federal-Mogul Div., Federal-Mogul-Bower Bearings, Inc., Detroit, Mich. (bushings, sleeves, ferrules)
General Tire & Rubber Co., Logansport, Ind. (Blower mounting)
Harrison Sheet Steel Co., Chicago, Ill. (covers for radiators)
Mueller Brass Co., Port Huron, Mich. (Specially fabricated copper tubing, machine formed tubes)
National Lock Co., Inc., Rockford, Ill. (hinges, handles, latches, catches, supports, etc.)
Nylok Corp., The, Paramus, N. J. (self-locking fasteners)
Phoenix Products Co., Milwaukee, Wis. (metal spinnings for fan housings, diffusers, etc.)
Pittsfield Products, Inc., Ann Arbor, Mich. (perforated wire cloth parts)
South Chester Corp., Southco Div., Lester, Pa. (blind rivets, panel fasteners, door retaining springs)
Standard Pressed Steel Co., Jenkintown, Pa. (socket screws, spring pins)
Utica Products, Inc., Utica, N. Y.
Ventfabrics, Inc., Chicago, Ill. (damper hardware for making dampers)

PARTS, REFRIGERATING COMPRESSOR

Frick Co., Waynesboro, Pa.
Hunt Spiller Mfg. Corp., Boston, Mass.
Production Stamping Co., Omaha, Nebr.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Shank Co., Cyrus, Chicago, Ill.
Voss Co., Inc., J. H. H., New York, N. Y. (air & gas compressors)
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

PENETRANT, DYE, FOR NON-DESTRUCTIVE TESTING OF METAL

Turco Products, Inc., Los Angeles, Calif.

PENETRANT SOLVENT FOR LOOSENING THREADED JOINTS

See Solvent, Penetrant

pH INDICATORS

See Indicators, pH

PILLOW BLOCK BEARINGS

See Bearings, Pillow Block

PILOT LIGHTS

See Lights, Pilot and Signal

PILOTS, GAS, FOR OIL BURNERS

Eclipse Fuel Engineering Co., Rockford, Ill.
Ransome Co., Emeryville, Calif.
Scully Signal Co., Melrose, Mass.
White-Rodgers Co., St. Louis, Mo.

PIPE, ALUMINUM

Aluminum Co. of America, Pittsburgh, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Harvey Aluminum, Torrance, Calif.
Kaiser Aluminum & Chemical Sales, Inc., Chicago, Ill.
Revere Copper & Brass, Inc., New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Youngstown Welding & Engineering Co., Youngstown, O.

PIPE, ASBESTOS FIBER AND CEMENT

Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.

PIPE BENDERS

See Benders, Pipe

PIPE BIT SETS

See sets, Pipe Bit

PIPE, BRASS AND COPPER

American Brass Co., Waterbury, Conn.
American Sanitary Mfg. Co., Abingdon, Ill.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Gardiner Metal Co., Chicago, Ill.
Hussey & Co., C. G., Div. Copper Range Co., Pittsburgh, Pa.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Phelps Dodge Copper Products Corp., New York, N. Y.
Reading Tube Corp., New York, N. Y.
Revere Copper and Brass, Inc., New York, N. Y.
Roberts Tube Div., Prestyle Mfg. Co., Detroit, Mich.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Detroit, Mich.

PIPE, CAST IRON, PRESSURE, BELL AND SPIGOT

Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Central Foundry Co., Newark, N. J.
Clow & Sons, Inc., James B., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Inner-Tite Div. of Yara Engineering Corp., Elizabeth, N. J.
Lynchburg Foundry Co., Lynchburg, Va.
McWane Cast Iron Pipe Co., Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Warren Foundry & Pipe Corp., New York, N. Y.

PIPE, CAST IRON, PRESSURE FLANGED

Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, Inc., James B., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Lynchburg Foundry Co., Lynchburg, Va.
McWane Cast Iron Pipe Co., Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Warren Foundry & Pipe Corp., New York, N. Y.

PIPE, CAST IRON, THREADED

American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, Inc., James B., Chicago, Ill.
McWane Cast Iron Pipe Co., Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Warren Foundry & Pipe Corp., New York, N. Y.

PIPE CLEANING COMPOUNDS

See Compounds, Cleaning Pipe Coil and Condenser

PIPE CLEANING MACHINES

See Machines, Pipe Cleaning; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

PIPE COILS

See Coils, Pipe

PIPE COUPLINGS

See Couplings, Pipe

PIPE COVERING, ADHESIVES

See Adhesives, for Pipe Covering

PIPE CUTTERS

See Cutters

PIPE CUTTING MACHINES

See Machines, Pipe Cutting and Threading; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

PIPE EXTRACTORS

See Extractors, Pipe

PIPE, FIBER

Brown Co., Boston, Mass.
Central Foundry Co., Newark, N. J.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Manufacturers Corp., Mansfield, O.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Richland Co., Mansfield, O.

PIPE, FINNED

California Steel Products Div., Richmond, Calif.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Edwards Engineering Corp., Pompton Plains, N. J.
Frick Co., Waynesboro, Pa. (square and spiral)
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
Sterling Radiator Co., Inc., Westfield, Mass.
Tenney Engineering, Inc., Union, N. J.
Vulcan Radiator Co., Hartford, Conn.

PIPE AND FITTINGS, GAS VENT AND FLUE

Acme Mfg. Co., Philadelphia, Pa.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Char-Gale Mfg. Co., Minneapolis, Minn.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Condensation Engineering Corp., Chicago, Ill.
Corbman Bros., Inc., Philadelphia, Pa.
Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Harvey Aluminum, Torrance, Calif.
Howes-Woods Co., Cambridge, Mass.
Johns-Manville, New York, N. Y.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Metal Fabricators, Inc., Charlotte, N. C.
Meyer & Bro. Co., F., Peoria, Ill.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Robinson Clay Product Co., The, Akron, O.
Van-Packer Corp., Bettendorf, Ia.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Williamson Co., Cincinnati, O.

PIPE FITTINGS

See Fittings, Pipe

PIPE, GLASS

Corning Glass Wks., Corning, N. Y.
Fischer & Porter Co., Hatboro, Pa.

PIPE HANGERS

See Hangers and Supports, Pipe

PIPE, HARD RUBBER

American Hard Rubber Co., New York, N. Y.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Gates Engineering Co., Wilmington, Del.
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O.
Hewitt-Robins, Inc., Stamford, Conn.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Raybestos-Manhattan, Inc., Passaic, N. J. (Flexible)
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.

PIPE INSULATION ADHESIVES

See Adhesives, for Pipe Covering

PIPE, JACKETED

Carpenter Monolithic Floating Ice Rink Floor Co., Cleveland, O.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Flori Pipe Co., The, St. Louis, Mo.
Heat & Power Corp., Baltimore, Md.
Kaiser Co., E. B., Glenview, Ill.
Midwest Piping Co., Inc., St. Louis, Mo.
Nooter Corp., St. Louis, Mo.
Parks-Cramer Co., Fitchburg, Mass.
Pittsburgh Pipe Coil & Bending Co., Etna, Pittsburgh, Pa.
Red Jacket, Inc., Carnegie, Pa.
Ric-wiL, Inc., Barberton, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Shaw-Kendall Engineering Co., Toledo, O.
Taylor Engineering Corp., Detroit, Mich.
Youngstown Welding & Engineering Co., Youngstown, O.

PIPE JOINT COMPOUNDS

See Cement and Compounds, Pipe Joint

PIPE LOCATORS

See Locators, Pipe, Underground

PIPE, LINED

American Cast Iron Pipe Co., Birmingham, Ala. (Cement)
American Hard Rubber Co., New York, N. Y. (Rubber)
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Barrows Porcelain Enamel Corp., Cincinnati, O. (glass, ceramic-coated)
Bart Mfg. Corp., Belleville, N. J.
Cement Lined Pipe Co., Lynn, Mass. (Cement)
Chemical Coatings & Engineering Co., Edgemont, Pa.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Gates Engineering Co., Wilmington, Del.
Goodrich Co., B. F., Akron, O. (Rubber-lined)
Goodrich Industrial Products Co., B. F., Akron, O.
Heil Process Equipment Corp., Cleveland, O.
Heresite & Chemical Co., Manitowoc, Wis. (Phenolic and rubber coatings)
Hill, Hubbell & Co., Cleveland, O.
Kaiser Co., E. B., Glenview, Ill.
Knapp Mills, Inc., Long Island City, N. Y.
Knight, Maurice A., Akron, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin lined)
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Michigan Pipe Co., Gagetown, Mich. (Wood, saran rubber)
National Lead Co., New York, N. Y. (Lead)
Nooter Corp., St. Louis, Mo.
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (Lead)
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
United States Rubber Co., New York, N. Y. (Rubber)
Warren Foundry & Pipe Corp., New York, N. Y. (Cement)
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, NICKEL AND NICKEL ALLOY

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Biggs Boiler Works Co., The, E. Akron, O.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Electric Steel Foundry Co., Portland, Ore.
International Nickel Co., Inc., The, New York, N. Y.
Revere Copper and Brass, Inc., New York, N. Y.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering Co., Youngstown, O.

PIPE, NICKEL PLATED

Alco Products, Inc., Schenectady, N. Y.
Bart Mfg. Corp., Belleville, N. J.
Saran Lined Pipe Co., Ferndale, Mich. (lectro-clad)

PIPE, PLASTIC

Alpha Plastics, Inc., Livingston, N. J. (PVC, rigid)
Amco Plastic Pipe Co., San Leandro, Calif. (rigid & semi-flexible)
American Agile Corp., Bedford, O.
American Hard Rubber Co., New York, N. Y.
American Molding Co., San Francisco, Calif.
Anesite Co., Skokie, Ill. (polyethylene, butyrate)
Associated Plastic Co's., Inc., Midland, Mich. (rigid polyvinyl)
Atlas Mineral Products Co., Mertztown, Pa. (rigid polyvinyl chloride for service up to 150 F)
Carlon Products Corp., Cleveland, O.
Carpenter Steel Co., Union, N. J. (rigid unplasticized PVC)
Chesflex Corp., Yonkers, N. Y. (polyethylene, flexible)
Colonial Plastics Mfg. Co., Cleveland, O. (Rigid PVC 40 - 160 F pressures function of size, wall thickness and Temp.)
Commercial Plastics Co., Chicago, Ill.
Continental Can Co., Millsplastic Pipe Div., New York, N. Y.
Continental-Diamond Div. of The Budd Co. Inc., Newark, Del.
Corite Products, Inc., Chicago, Ill. (rigid fiberglas, reinforced polyester)
Corning Glass Works, Corning, N. Y. (PVC)
Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind. (flexible, semi-rigid)
Dow Chemical Co., Midland, Mich. (saran-lined pipe, iron or steel and saran pipe)
DuVerre, Inc., Hamburg, N. Y.
Easton Plastic Products Co., Easton, Pa. (rigid-unplasticized polyvinyl chloride)
Fibercast Corp., Sand Spring, Okla.
Franklin Plastics, Inc., Franklin, Pa. (polyethylene non-rigid. Temp. not to exceed 140 F. Pressures from 40 to 104 lbs.)
General Ceramics Corp., Keasbey, N. J. (rigid, 50 psi; 350F)
Goodrich Industrial Products Co., B. F., Plastics Products, Marietta, O. (polyvinyl chloride rigid)
Goodrich Industrial Products Co., B. F., Akron, O. (Max. 150 F pressures to 400 psi; rigid)
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hartwell & Son, Inc., H. N., Boston, Mass. (rigid PVC)
Haveg Industries, Inc., Newark, Del. (Resin-asbestos, polyester glass & polyvinyl chloride)
Heil Process Equipment Corp., Cleveland, O. (rigid)
Irvington Varnish & Insulator, Div. of Minnesota **Mining & Mfg. Co., Irvington, N. J. (flexible)**
Johnson Plastic Corp., Chagrin Falls, O. (polyethylene, tenite & kralastic)
Knight, Maurice A., Akron, O. (rigid, glass cloth reinforced resin 280 F)
Kraloy Plastic Pipe Co., Inc., Los Angeles, Calif.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Luzerne Rubber Co., Trenton, N. J. (rigid-PVC)
Manufacturers Corp., Mansfield, O.
Minnesota Mining & Mfg. Co., St. Paul, Minn. (2" to 3" 150 F Max. 1200 psi)
Mueller Brass Co., Port Huron, Mich. (Non-rigid temp. range up to 140 F)
Munray Products, Inc., Cleveland, O. (polyethylene, flexible)
National Tube Div., United States Steel Corp., Pittsburgh, Pa. (flexible polyethylene) (rigid polyvinyl chloride)
Naugatuck Chemical Div., United States Rubber Co., Naugatuck, Conn.
Perfex Plastics, Inc., Chicago, Ill.
Plastex Corp., Columbus, O. (non-rigid)
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif. (flexible polyethylene; semi-rigid butyrate)
Polymer Corp. of Pa., The, Reading, Pa. (rigid, nylon)
Pyramid Plastics, Inc., Chicago, Ill. (saran; rigid)
Reflin Co., San Diego, Calif. (rigid, reinforced with glass fibers 200 psi; 170F)
Republic Steel Corp., Cleveland, O. (polyethylene, kralastic, and butyrate; flexible & semi rigid)
Richland Co., Mansfield, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill. (rigid & non-rigid)
Saran Lined Pipe Co., Ferndale, Mich. (saran)
Seelye Craftsman, Minneapolis, Minn. (boltaron rigid)
Skyline Industries, Titusville, Pa. (rigid and flexible)
Southern Plastics Co., Columbia, S. C. (rigid, non-rigid)
Southwestern Plastic Pipe Co., Mineral Wells, Tex.
Texas Vitrified Pipe Co., Mineral Wells, Tex. (polyethylene-rigid PVC)
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (flexible, semi-rigid high impact & rigid PVC)
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J. (rigid up to 225F; PVS)
Walworth Co., New York, N. Y.
Western Plastics Corp., Tacoma, Wash. polyethylene & kralastic)
Yardley Plastics Co., Columbus, O. (rigid and non-rigid O F - 125 F)

PIPE PLUGS

See Plugs, Pipe

PIPE, PRE-INSULATED

Beltran Associates, Inc., Brooklyn, N. Y.
Durant Insulated Pipe Co., Palo Alto, Calif.
Durant Insulated Pipe Co., Inc., Williamstown, N. J.
Kaiser Co., E. B., Glenview, Ill.
Ric-wiL, Inc., Barberton, O.

PIPE REAMERS

See Reamers, Pipe

PIPE REPAIR CLAMPS

See Clamps, Pipe Repair

PIPE, SPIRAL, RIVETED AND WELDED

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Naylor Pipe Co., Chicago, Ill.
Nikoh Tube Co., Chicago, Ill.
Taylor Forge & Pipe Wks., Chicago, Ill.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

PIPE, STEAM TRACED

Aluminum Co. of America, Pittsburgh, Pa.

PIPE, STEEL, ALLOY

Alco Products, Inc., Schenectady, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Taylor Forge & Pipe Wks., Chicago, Ill.
Trent Tube Co., East Troy, Wis.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering Co., Youngstown, O.

PIPE, STEEL, BUTT AND LAP WELDED

Bethlehem Steel Co., Bethlehem, Pa.
Biggs Boiler Works Co., The, **E. Akron, O.** (large diameter)
Central Steel & Wire Co., Chicago, Ill.
Chicago Metal Mfg. Co., Chicago, Ill.
Fretz-Moon Tube Co., Butler, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Laclede Steel Co., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O. (electric-weld)
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y. (Specially fabricated)
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Wheatland Tube Co., Philadelphia, Pa.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, STEEL, SEAMLESS

Alco Products, Inc., Schenectady, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bart Mfg. Corp., Belleville, N. J. (nickel coated)
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Mesta Machine Co., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Phoenix Iron & Steel Co., Phoenixville, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, STEEL, STAINLESS

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Electric Steel Foundry Co., Portland, Ore.
Excelsior Steel Furnace Co., The, Chicago, Ill.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Pypon Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Republic Steel Corp., Steel and Tubes Div., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Stainless Welded Products, Inc., Clifton, N. J.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering Co., Youngstown, O.

PIPE, STONEWARE

General Ceramics Corp., Keasbey, N. J.
Knight, Maurice A., Akron, O. (acid-proof)
United States Stoneware Co., New York, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O. (also porcelain)

PIPE SUPPORTS

See Hangers and Supports, Pipe

PIPE SURFACE, THERMOMETERS

See Thermometers, Indicating, Pipe Surface

PIPE, TIN

Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Bunker Hill Co., The, Sales & Fabrication Div., Seattle, Wash.
Division Lead Co., Summit, Ill.
Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Henry Furnace Co., Medina, O.
National Lead Co., New York, N. Y.
Revere Copper & Brass, Inc., Standard Rolling Mills Div., Brooklyn, N. Y.

PIPE TONGS
See Tongs, Pipe

PIPE, TUBING, FITTINGS AND VALVES, CARBON AND GRAPHITE
General Ceramics Corp., Keasbey, N. J.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.

PIPE AND TUBING, LEAD AND LEAD ALLOY
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Bunker Hill Co., The, Sales & Fabrication Div., Seattle, Wash.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Gardiner Metal Co., Chicago, Ill.
National Lead Co., New York, N. Y.
Revere Copper & Brass, Inc., Standard Rolling Mills Div., Brooklyn, N. Y.
Rochester Lead Works, Inc., Rochester, N. Y.

PIPE, VITRIFIED CLAY
Bowerston Shale Co., The, Bowerston, O.
General Ceramics Corp., Keasbey, N. J.
Heat Transmission Conduit Co., Cleveland, O.
Logan Clay Products, Logan, O.
Robinson Clay Product Co., The, Akron, O.
Stillwater Clay Products Co., The, Cleveland, O.
Superior Clay Corp., The, Uhrichsville, O.
Texas Vitrified Pipe Co., Mineral Wells, Tex.

PIPE, WOOD
Bowerston Shale Co., The, Bowerston, O.
Michigan Pipe Co., Gagetown, Mich.

PIPE WRENCHES
See Wrenches, Pipe

PIPE, WROUGHT IRON
Byers Co., A. M., Pittsburgh, Pa.

PIPING, FABRICATED
See Bends Expansion Steam Pipe; Headers, Pipe, Welded; Coils, Pipe

PIPING IDENTIFICATON MARKERS
See Identification Markers for Piping Services

PISTON RINGS
See Rings, Piston

PITOT TUBES
See Tubes, Pitot

PITTSBURGH LOCK FORMING MACHINES
See Machines, Pittsburgh Lock Forming

PLASTIC PIPE METAL INSERTS
See Inserts, Metals, for Plastic Pipe

PLASTIC PIPE AND PIPE FITTINGS
See Pipe, Plastic; Fittings, Pipe, Plastic

PLASTIC PIPE AND SHEET WELDERS
See Welders, for Plastic Pipe or Plastic Sheet

PLASTIC SHEETS FOR DUCTS AND HOODS
See Sheets, Plastic for Ducts and Hoods

PLASTIC TUBING
See Tubing, Plastic

PLASTICS, POWDERS AND RESINS (BASIC MATERIALS)
Bakelite Co., Div. of Union Carbide & Carbon Chemical Corp., New York, N. Y.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Chemical Sales Div., Firestone Plastics Co., Pottstown, Pa.
Dow Chemical Co., The, Midland, Mich.
Dow Corning Co., Midland, Mich.
du Pont de Nemours & Co., E. I. Polychemicals Dept., Wilmington, Del. (nylon, polyethylene, tetrafluoroethylene & acrylic resins)
Durez Plastics Div., Hooker Electrochemical Co. North Tonawanda, N. Y.
General Electric Co., Chemical & Metallurgical Div., Pittsfield, Mass. (phenolic, permafil and polyester resins)
General Tire & Rubber Co., Akron, O.
Goodrich Chemical Co., B. F., Cleveland, O.
Interchemical Corp., Finishes Div., Newark, N. J. (polyester resins)
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plastics Div., Eastman Chemical Products, Inc., Kingsport, Tenn. (acetate, butyrate, polyethylene)
Polymer Corp. of Pa., The, Reading, Pa.
United States Rubber Co., New York, N. Y.

PLATES, FLOOR AND CEILING
American Sanitary Mfg. Co., Abingdon, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Eastern Stainless Steel Corp., Baltimore, Md.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
G & H Mfg. Co., Philadelphia, Pa.
Globe Products, Huppower Div., Hupp Corp., Detroit, Mich.
Grinnell Co. Providence, R. I.
Inland Steel Co., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
Little Brass Goods Co., M. S., Hartford, Conn.
New York Air Valve Corp., Brooklyn, N. Y.
Pipe Plugs, Inc., Wellington, O.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
U. S. Plug & Fitting Co., Wellington, O.
Walworth Co., New York, N. Y.
Zurn Mfg. Div., J. A., Zurn Industries, Inc., Erie, Pa.

PLUG COCKS
See Valves, Plug

PLUG VALVES
See Valves, Plug

PLUGS, FUSIBLE, BOILER
Allen Mfg. Co., W. D., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Chiksan Co., Brea, Calif.
Division Lead Co., Summit, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Lamson & Sessions Co., The, Cleveland, O.
Lunkenheimer Co., Cincinnati, O.
Mueller Brass Co., Port Huron, Mich.
Powell Co., Wm., The, Cincinnati, O.
Swift Lubricator Co., Inc., Elmira, N. Y.

PLUGS, PIPE, MAGNETIC, FOR REMOVING FERROUS PARTICLES
Pipe Plugs, Inc., Wellington, O.
U. S. Plug & Fitting Co., Wellington, O.

PLUGS, REPAIR, FOR PIPE
Adams Pipe Repair Products, El Monte, Calif.
Allen Mfg. Co., W. D., Chicago, Ill.
Baker & Co., R. H., Huntington Park, Calif.
Kuhns Bros. Co., Dayton, O.
Parker-Kalon Div., Gen. Am. Trans. Corp., Clifton, N. J.
Pipe Plugs, Inc., Wellington, O.
Protective Closures Co., Buffalo, N. Y.
Scharer & Co., Ray A., Detroit, Mich.

PLUGS, REPAIR, FOR TANKS
Adams Pipe Repair Products, El Monte, Calif.
Baker & Co., R. H., Huntington Park, Calif.
Chicago Specialty Mfg. Co., Chicago, Ill.
Kenney Co., L. C., Chicago, Ill.
Parker-Kalon Div., Gen. Am. Trans. Corp., Clifton, N. J.
Pipe Plugs, Inc., Wellington, O.
Standard Pressed Steel Co., Jenkintown, Pa.
U. S. Plug & Fitting Co., Wellington, O.

PLUGS, TUBING TEST
Chicago Specialty Mfg. Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Mechanical Products Corp., Chicago, Ill.

PORTS, OBSERVATION, BOILER
Bigelow Liptak Corp., Detroit, Mich.
Detroit Stoker Co., Monroe, Mich.
Ess Instrument Co., Bergenfield, N. J.
Green Fire Brick Co., Mexico, Mo.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Plibrico Co., Chicago, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reintjes Co., Geo. P., Kansas City, Mo.
Springfield Boiler Co., Springfield, Ill.

POSITIONERS, WELDING
Johnson Machine Works, Eau Claire, Wis.
Sight Feed Generator Co., West Alexandria, O.
Webb Corp., The, Webb City, Mo.
Weldit, Inc., Detroit, Mich.
Worthington Corp., Harrison, N. J.

POWER FACTOR CORRECTION
See Capacitors

POWER SHEARS
See Shears, Power

PREHEATERS, FUEL OIL
Alco Products, Inc., Schenectady, N. Y.
Alstrom Corp., New York, N. Y.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
Andale Co., Philadelphia, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., The, Elyria, O.
Buxton Mfg. Co., Dover, N. J.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Co., Flushing, L. I., N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drying Systems, Inc., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Electro-Therm, Inc., Silver Spring, Md.
Engineer Co., New York, N. Y.
Falcon Equipment Co., New Brighton, Pa.
General Fittings Co., East Greenwich, R. I.
Griscom-Russell Co., Massillon, O.
Hauck Mfg. Co., Brooklyn, N. Y.
Heatron, Inc., York, Pa.
Heatube Corp., Allegan, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo. (Electric)
Johnson Corp., The, Three Rivers, Mich.
Kaiser Co., E. B., Glenview, Ill.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp., Kewanee, Ill.
Killebrew Engineering Corp., St. Louis, Mo.
Leahy Mfg. Co., Los Angeles, Calif.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Lientz Co., B. P., Kansas City, Mo.
Manning & Lewis Engineering Co., Newark, N. J.
National Airoil Burner Co., Inc., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
Patterson-Kelley Co., Inc., The, East-Stroudsburg, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Rempe Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Sims Co., Erie, Pa.

Staples & Pfeiffer, San Francisco, Calif.
Superior Combustion Industries, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Tranter Mfg., Inc., Lansing, Mich.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Whitlock Mfg. Co., W. Hartford, Conn.
Wiegand Co., Edwin L., Pittsburgh, Pa. (Electric)
York-Shipley, Inc., York, Pa.
Yula Water Heaters, Inc., Bronx, N. Y.

PREHEATERS AND STRESS RELIEVERS, ELECTRIC, FOR PIPE WELDS

Electric Arc, Inc., Newark, N. J.
Falcon Equipment Co., New Brighton, Pa.
Heatube Corp., Allegan, Mich.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wiegand Co., Edwin L., Pittsburgh, Pa.

PRE-INSULATED PIPE

See Pipe, Pre-Insulated

PRESSURE BLOWERS

See Blowers, High Pressure

PRESSURE CONTROLLERS

See Regulators, Pressure

PRESSURE GAGES

See Gages, Indicating, Pressure

PRESSURE INDICATOR-CONTROLLERS

See Indicator-Controllers, Pressure

PRESSURE RECORDER-CONTROLLERS

See Recorder-Controllers, Pressure

PRESSURE RECORDERS

See Recorders, Pressure and Vacuum

PRESSURE REDUCING VALVES

See Valves, Pressure Reducing and Regulating

PRESSURE REGULATING VALVES

See Valves, Pressure Reducing and Regulating

PRESSURE REGULATORS

See Regulators, Pressure

PRESSURE SWITCHES

See Switches, Pressure and Vacuum

PROCESS HEATING SYSTEMS

See Systems, Process Heating, High Temperature

PROCESS STEAM SUPERHEATERS

See Superheaters, Process Steam

PROCESS AND STORAGE TANKS

See Tanks, Process and Storage

PROPANE VAPORIZERS

See Vaporizers

PROPELLER FANS

See Fans, Propeller

PROPELLER PUMPS

See Pumps, Propeller

PROPORTIONING PUMPS

See Pumps, Proportioning

PROTECTIVE COATINGS

See Coatings, Protective, for Metals

PROTECTORS, GAGE GLASS

Ernst Water Column & Gauge Co., Livingston, N. J.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Wright-Austin Co., Detroit, Mich.

PROTECTORS, PIPE COVERING

Baldwin-Hill Co., Trenton, N. J.
Bigelow Liptak Corp., Detroit, Mich.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Carpenter & Paterson, Inc., Cambridge, Mass.
Childers Mfg. Co., Houston, Tex.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Grant Wilson, Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Keystone Asphalt Products Co., Chicago, Ill.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
Poe Co., C. W., The, Cleveland, O. (Alum. jacketing)
Rector Mineral Trading Corp., New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Smith Products Co., Northville, Mich.

PSYCHROMETERS, MOTOR ASPIRATED

Bahnson Co., Winston-Salem, N. C.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N.Y.
Scientific Instrument Co., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

PSYCHROMETERS, SLING AND HAND ASPIRATED

Abbeon Supply Co., Jamaica, N. Y.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Moistening Co., Providence, R. I.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Scientific Equipment Co., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Moeller Instrument Co., Richmond Hill, N.Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Parks-Cramer Co., Fitchburg, Mass.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.

PSYCHROSTATS

See Humidistats

PULLEYS AND SHEAVES, FOR BELT DRIVES

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa. (adjustable diameter)
Boston Woven Hose & Rubber Co., Cambridge, Mass. (taper bushing)
Browning Mfg. Co., Maysville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill. (V belt)
Chicago Die Casting Mfg. Co., Chicago, Ill. (v-type and flat type)
Climax Metal Products Co., Cleveland, O. (v-belt and variable pitch)
Congress Drives Div., Tann Corp., Detroit, Mich. (V belt—fractional and multiple horsepower, and variable pitch)
Dayton Rubber Co., Dayton, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn. (V-Belt)
Duro Metal Products Co., Chicago, Ill. (steel & diecast)
Equipment Engineering Co., Minneapolis, Minn. (variable pitch)
Ft. Worth Steel & Machinery Co., Ft. Worth, Texas
Gates Rubber Co., The, Denver, Colo.
Goldens' Foundry & Machine Co., Columbus, Ga. (Cast iron)
Hewitt-Robins, Inc., Stamford, Conn. (Tapered cone, conveyor, flanged, grooved for round or V-Belt, iron, loose, motor, power transmission)
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill. (flat)
Lau Blower Co., Dayton, O.
Lovejoy Flexible Coupling Co., Chicago, Ill. (variable speed pulleys, v-belt sheaves)
Maurey Mfg. Corp., Chicago, Ill. (v-belt steel and cast iron)
Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O.
Pyott Foundry & Machine Co., Chicago, Ill.
Reeves Pully Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind. (variable speed)
Speed Selector Inc., Chagrin Falls, O. (variable pitch)
Sprout-Waldron & Co., Muncy, Pa. (cast iron standard pulleys)
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J. (v-type)
Zatko Metal Products Co., Euclid, O. (stamped-one piece)

PULVERIZED COAL BURNERS

See Burners, Pulverized Coal

PUMP BASES

See Bases and Pads, Vibration Isolating

PUMP-MOTOR UNITS, SELF-CONTAINED

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Becher Pump Co., Chicago, Ill.
Canton Stoker Corp., Canton, O.
Carver Pump Co., Muscatine, Ia.
Chempump Corp., Philadelphia, Pa. (canned motor)
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Gould Pumps, Inc., Seneca Falls, N. Y.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Haskel Engineering & Supply Co., Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lecourtenay Co., Newark, N. J.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Ruthman Machinery Co.; Cincinnati, O.
Sta-Rite Products, Inc., Delavan, Wis.
Uniflow Mfg. Co., Erie, Pa.
Vanton Pump & Equipment Corp., Hillside, N. J.
Webster Electric Co., Racine, Wis.
Weinman Pump Mfg. Co., The, Columbus, O.
Worthington Corp., Harrison, N. J.

PUMP UNITS, FUEL OIL

See Units, Fuel Oil, Heating, Pumping and Straining

PUMP VALVES

See Valves, Pump

PUMPS, BOILER FEED

Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.

Buffalo Pumps Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Canton Stoker Corp., Canton, O.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Clayton Mfg. Co., El Monte, Calif.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Cyclotherm Div., National-U. S. Radiator Corp., Oswego, N. Y.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Dearborn Chemical Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Harford, Conn.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eclipse Fuel Enginering Co., Rockford, Ill.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Corp., The, Three Rivers, Mich.
Johnston Pump Co., Pasadena, Calif.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa.
Lawrence Pump & Engine Co., Lawrence, Mass.
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York.
Robbins & Myers, Inc., Springfield, O.
Roth Co., Roy E., Rock Island, Ill.
Schaub Engineering Co., Fred H., Chicago, Ill.
Skidmore Corp., St. Joseph, Mich.
Sta-Rite Products, Inc., Delavan, Wis.
Sterling, Inc., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Swaby Mfg. Co., Chicago, Ill.
Union Steam Pump Co., Battle Creek, Mich.
United Centrifugal Pumps, Oakland, Calif.
Universal Mfg. Co., Berkeley, Calif.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CENTRIFUGAL

Advance Pump Co., Berkeley, Calif.
Alliance Industries, Huntingden Valley, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Well Wks., Aurora, Ill.
Ampco Metal, Inc., Milwaukee, Wis.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Barrett Haentjens & Co., Hazleton, Pa.
Bart Mfg. Corp., Belleville, N. J.
Bell & Gossett Co., Morton Grove, Ill.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Carver Pump Co., Muscatine, Ia.
Chain Belt Co., Milwaukee, Wis.
Chempump Corp., Philadelphia, Pa. magnetically driven, canned motor)
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Corley Co., Inc., The, New York, N. Y.
Davidson Co., M. T., New York, N. Y.
Dayton Electric Mfg. Co., Chicago, Ill.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Dearborn Chemical Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
DeLaval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Duro Co., The, Dayton, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eco Engineering Co., Newark, N. J.
Essick Mfg. Co., Los Angeles, Calif.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Frederick Iron & Steel Inc., Frederick, Md.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Gardner-Denver Co., Quincy, Ill.
Gen-A-Matic Corp., Van Nuys, Calif.
General Ceramics Corp., Keasby, N. J. (chemical plastic and alumina, porcelain and graphite)
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Goodfellow Co., Inc., F. D., Memphis, Tenn.
Gorman-Rupp Industries, Inc., Belleville, O.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Granberg Corp., Oakland, Calif.
Holden Co., A. F., Detroit, Mich.
Industrial Filter & Pump Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
La Bour Co., Inc., The, Elkhart, Ind.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pump Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead lined and all lead)
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Marlow Pumps, Division of Bell & Gossett Co., Ridgewood, N. J.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Memphis Pump & Mfg. Co., Memphis, Tenn.
Myers & Bro. Co., F. E., The, Ashland, O.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Lead Co., New York, N. Y.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Radiant Utilities Corp., Brooklyn, N. Y.
Red Jacket Co., Inc., Carnegie, Pa.
Red Jacket Mfg. Co., Davenport, Ia.
Ruthman Machinery Co., Cincinnati, O.
Saran Lined Pipe Co., Ferndale, Mich. (Saran Lined)
Schneible Co., Claude B., Detroit, Mich.
Skidmore Corp., St. Joseph, Mich.
Standard Electric Mfg. Co., West Berlin, N. J.
Sta-Rite Products, Inc., Delavan, Wis.
Sterling, Inc., Milwaukee, Wis.
Swaby Mfg. Co., Chicago, Ill.
Taber Pump Co., Buffalo, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Tech-Tron Corp., Lawrence, Kans.
Trane Co., The, LaCrosse, Wis.
Union Steam Pump Co., Battle Creek, Mich.
United Centrifugal Pumps, Oakland, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whitewater Pump Co., Inc., Whitewater, Wis.
Wintroath Pumps, Div. of Worthington Corp., Alhambra, Calif.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CONDENSATE, FOR REMOVING CONDENSATION FROM AIR CONDITIONING UNITS

For removal of water condensed from air on cooling and dehumidifying coils. For Condensate Return Pumps, see Pumps, Condensate Return. For Air Conditioning Pumps, see Pumps of various types, such as pumps, Centrifugal and others

Ashcraft Co., J. P., Dallas, Tex.
Beach-Russ Co., New York, N. Y.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Davidson Co., M. T., New York, N. Y.
Deming Co., Salem, O.
Eastern Industries, Inc., Hamden, Conn.
Eddington Metal Specialty Co., Eddington, Pa.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Johnston Pump Co., Pasadena, Calif.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
March Mfg. Co., Inc., Skokie, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless of America, Inc., Chicago, Ill.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.

PUMPS, CONDENSATE RETURN

Advance Pump Co., Berkeley, Calif.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes & Jones, Inc., Newtonville, Mass.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Canton Stoker Corp., Canton, O.
Chempump Corp., Philadelphia, Pa. (canned motors)
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Cochrane Corp., Philadelphia, Pa.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.

Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Dutton Boiler Div., Hapman-Dutton, Co. Kalamazoo, Mich.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Faber Engineering Co., Inc., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Heating Assurance, Inc., Spokane, Wash.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Corp., The, Three Rivers, Mich.
Johnston Pump Co., Pasadena, Calif.
Kisco Boiler & Engineering Co., St. Louis.
Kattner Mfg. Co., P. M., Cedar Rapids, Iowa
Lawrence Pump & Engine Co., Lawrence, Mass.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Roth Co., Roy E., Rock Island, Ill.
Sarco Co., Inc., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago.
Sellers Engineering Co., Chicago, Ill.
Skidmore Corp., St. Joseph, Mich.
Sta-Rite Products, Inc., Delavan, Wis.
Sterling, Inc., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Swaby Mfg. Co., Chicago, Ill.
Trane Co., The, LaCrosse, Wis.
Union Steam Pump Co., Battle Creek, Mich.
Universal Mfg. Co., Berkeley, Calif.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CONTROLLED VOLUME

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Carver Pump Co., Muscatine, Ia.
Dearborn Chemical Co., Chicago, Ill.
Hills-McCanna Co., Chicago, Ill.
Madden Corp., The, Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.

PUMPS, DEEP WELL, TURBINE

Advance Pump Co., Berkeley, Calif.
American Well Wks., Aurora, Ill.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Davidson Co., M. T., New York, N. Y.
Decatur Pump Co., Decatur, Ill. (shallow well)
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Pump Co., Pasadena, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa. (submersible)
Layne & Bowler, Inc., Memphis, Tenn.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Smith Corp., A. O., Milwaukee, Wis.
Sta-Rite Products, Inc., Delavan, Wis.
Wintroath Pump, Div. of Worthington Corp., Alhambra, Calif.
Worthington Corp., Harrison, N. J.

PUMPS, EVAPORATIVE COOLER

Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Carver Pump Co., Muscatine, Ia.
Chempump Corp., Philadelphia, Pa. (canned motors)
Deming Co., Salem, O.
Essick Mfg. Co., Los Angeles, Calif.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Ingersoll-Rand Co., New York, N. Y.
International Metal Products, Phoenix, Ariz.
Jabsco Pump Co., Burbank, Calif.
Krueger Air Conditioning Co., Tucson, Ariz.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Myers & Bro. Co., F. E., The, Ashland, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Ruthman Machinery Co., Cincinnati, O.
Taco Heaters, Inc., Cranston, R. I.
Tech-Tron Corp., Lawrence, Ks.
Thermador Electrical Mfg., Los Angeles, Calif.
Warren Steam Pump Co., Inc., Warren, Mass.
Weinman Pump Mfg. Co., The, Columbus, O.
Wright Mfg. Co., Phoenix, Ariz.

PUMPS, FIRE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
De Laval Steam Turbine Co., Trenton, N. J.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gorman-Rupp Industries, Inc., Belleville, O.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Healey Co., Lee, Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Layne & Bowler, Inc., Memphis, Tenn.
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Marlow Pumps, Division of Bell & Gossett Co., Ridgewood, N. J.
Myers & Bro. Co., F. E., The, Ashland, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Royalton Co., Inc., Gasport, N. Y.
Solar Aircraft Co., San Diego, Calif. (gas turbine)
Universal Mfg. Co., Berkeley, Calif.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Worthington Corp., Harrison, N. J.

PUMPS, GEAR

American Hard Rubber Co., New York, N. Y.
DeLaval Steam Turbine Co., Trenton, N. J.
Granberg Corp., Oakland, Calif.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich. (hydraulic)
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Minneapolis, Minn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Roper Corp., Geo. D., Rockford, Ill.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Webster Electric Co., Racine, Wis.
Worthington Corp., Harrison, N. J.

PUMPS, HIGH PRESSURE, HYDRAULIC

Aldrich Pump Co., Allentown, Pa.
American Engineering Co., Philadelphia, Pa.
American Instrument Co., Inc., Silver Spring, Md.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Autoclave Engineers Sales Corp., Erie, Pa.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Blackhawk Mfg. Co., Milwaukee, Wis.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
C C Pump Mfg. Div., Palmyra, N. J.
Canton Stoker Corp., Canton, O.
Carpenter Valve Corp., The, Cleveland, O. (hand)
Coffin Co., J. S., Jr., Englewood, N. J.
Commercial Shearing & Stamping Co., Youngstown, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Gorman-Rupp Industries, Inc., Belleville, O.
Gray Co., Inc., Minneapolis, Minn.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Kobe Inc., Huntington Park, Calif.
LeCourtenay Co., Newark, N. J.
Ledeen Mfg. Co., Los Angeles, Calif.
Milton Roy Co., Philadelphia, Pa.
Myers & Bro., Co., F. E. The, Ashland, O.
National Steam Pump Co., Upper Sandusky, O.
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Minneapolis, Minn.
Nye Tool Co., Chicago, Ill.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Red Jacket Mfg. Co., Davenport, Ia.
Robbins & Myers, Inc., Springfield, O.
Roper Corp., Geo. D., Rockford, Ill.
Royalton Co., Inc., Gasport, N. Y.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Tuthill Pump Co., Chicago, Ill.
Union Steam Pump Co., Battle Creek, Mich.
United Centrifugal Pumps, Oakland, Calif.
Viking Pump Co., Cedar Falls, Ia.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Warren Steam Pump Co., Inc., Warren, Mass.
Webster Electric Co., Racine, Wis.
Wilson Co., K. R., Arcade, N. Y.
Worthington Corp., Harrison, N. J.

PUMPS, HYDROSTATIC TEST, HAND-OPERATED

Autoclave Engineers Sales Corp., Erie, Pa.
Deming Co., Salem, O.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Pacific Pumping Co., Oakland, Calif.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

PUMPS, JET

Advance Pump Co., Berkeley, Calif.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Decatur Pump Co., Decatur, Ill.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Deming Co., Salem, O.
Duro Co., The, Dayton, O.
Everite Pump & Mfg. Co., Lancaster, Pa.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Myers & Bro. Co., F. E., The, Ashland, O.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Red Jacket Mfg. Co., Davenport, Ia.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Sta-Rite Products, Inc., Delavan, Wis.
Uniflow Mfg. Co., Erie, Pa.

Universal Mfg. Co., Berkeley, Calif.
Whitewater Pump Co., Inc., Whitewater, Wis.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

PUMPS, LIQUID REFRIGERANT CIRCULATING

Alliance Industries, Huntingden Valley, Pa.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Canton Stoker Corp., Canton, O.
Chempump Corp., Philadelphia, Pa. (canned motors)
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Corley Co., Inc., The, New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Heatron, Inc., York, Pa.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
LeCourtenay Co., Newark, N. J.
Myers & Bro. Co., F. E., The, Ashland, O.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Roper Corp., Geo. D., Rockford, Ill.
Roth Co., Roy E., Rock Island, Ill.
Universal Mfg. Co., Berkeley, Calif.
Viking Pump Co., Cedar Falls, Ia.
Vilter Mfg. Co., Milwaukee, Wis.
Warren Steam Pump Co., Inc., Warren, Mass.
Watkins Co., J. E., Maywood, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Worthington Corp., Harrison, N. J.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

PUMPS, PROPELLER

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Well Works, Aurora, Ill.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Chempump Corp., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Haertel Co., Walter, Minneapolis, Minn.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lawrence Pumps, Inc., Lawrence, Mass.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Ruthman Machinery Co., Cincinnati, O.
Universal Mfg. Co., Berkeley, Calif.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.

PUMPS, PROPORTIONING

American Instrument Co., Inc., Silver Spring, Md.
Bird-Archer Co., Philadelphia, Pa.
Bruner Corp., Milwaukee, Wis.
C C Pump Mfg. Div., Palmyra, N. J.
Dearborn Chemical Co., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Hills-McCanna Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Madden Corp., The, Chicago, Ill.
Marco Co., Inc., Saginaw, Mich.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Pacific Pumping Co., Oakland, Calif.
Philadelphia Pump and Machinery Co., Inc., Philadelphia, Pa.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Robbins & Myers, Inc., Springfield, O.
Texstream Corp., Houston, Tex.
Universal Mfg. Co., Berkeley, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Wallace & Tiernan Inc., Belleville, N. J.

PUMPS, RECIPROCATING

Aldrich Pump Co., Allentown, Pa.
American Hard Rubber Co., New York, N. Y. (Rubber and Rubber lined)
American-Marsh Pumps, Inc., Battle Creek, Mich.
Barnes Mfg. Co., Mansfield, O.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Canton Stoker Corp., Canton, O.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dearborn Chemical Co., Chicago, Ill.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Deming Co., Salem, O.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Duro Co., Dayton, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Gardner-Denver Co., Quincy, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Gray Company, Inc., Minneapolis, Minn.
Healey Co., Lee, Glendale, Calif.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Ledeen Mfg. Co., Los Angeles, Calif.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milton Roy Co., Philadelphia, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
National Steam Pump Co., Upper Sandusky, O.
Red Jacket Mfg. Co., Davenport, Ia.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Royalton Co., Inc., Gasport, N. Y.
Uniflow Mfg. Co., Erie, Pa.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., Harrison, N. J.

PUMPS, ROTARY

American Engineering Co., Philadelphia, Pa.
American Hard Rubber Co., New York, N. Y. (Rubber and rubber lined)
Beach-Russ Co., New York, N. Y.
Becher Pump Co., Chicago, Ill.
Blackmer Pump Co., Grand Rapids, Mich.
Chicago Pneumatic Tool Co., New York.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eco Engineering Co., Newark, N. J.
Eisler Engineering Co., Inc., Newark, N. J.
Fairbanks, Morse & Co., Chicago, Ill.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Granberg Corp., Oakland, Calif.
Healey Co., Lee, Glendale, Calif.
Jabsco Pump Co., Burbank, Calif.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Lindquist Pump Corp., Culver City, Calif.
Madden Corp., Chicago, Ill.
Marco Co., Inc., Saginaw, Mich.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Nash Engineering Co., South Norwalk, Conn.
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Minneapolis, Minn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Robbins & Myers, Inc., Springfield, O.
Roots-Connersville Blower Div., Connersville, Ind.
Roper Corp., Geo. D., Rockford, Ill.
Roth Co., Roy E., Rock Island, Ill.
St. Louis Tool Co., St. Louis, Mo.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Sundstrand Hydraulic Div., Rockford, Ill. (for oil burners high and low pressure)
Sutorbilt Corp., Los Angeles, Calif.
Taber Pump Co., Buffalo, N. Y.
Tuthill Pump Co., Chicago, Ill.
Ulrich Mfg. Co., Bump Pump Div., Roanoke, Ill.
Vanton Pump and Equipment Corp., Hillside, N. J.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Waukesha Foundry Co., Waukesha, Wis.
Webster Electric Co., Racine, Wis. (unit pump for oil burners)
Worthington Corp., Harrison, N. J.
Yale & Towne Mfg. Co., Stamford, Conn.

PUMPS, SEWAGE AND SLUDGE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Well Works, Aurora, Ill.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Becher Pump Co., Chicago, Ill.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Canton Stoker Corp., Canton, O.
Carver Pump Co., Muscatine, Ia.
Chicago Pneumatic Tool Co., New York, N. Y.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
DeLaval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Gorman-Rupp Industries, Inc., Belleville, O.
Healey Co., Lee, Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Lawrence Pumps, Inc., Lawrence, Mass.
Marlow Pumps, Division of Bell & Gossett Co., Ridgewood, N. J.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Robbins & Myers, Inc., Springfield, O.
Schneible Co., Claude B., Detroit, Mich.
Swaby Mfg. Co., Chicago, Ill.
Universal Mfg. Co., Berkeley, Calif.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, SEWAGE AND SLUDGE, SUBMERSIBLE

American Well Wks., Aurora, Ill.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Carver Pump Co., Muscatine, Ia.
Chicago Pneumatic Tool Co., New York.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Ferro Corp., Cleveland, O. (Compressed air operated)
Lawrence Pumps, Inc., Lawrence, Mass.
Universal Mfg. Co., Berkeley, Calif.
Weil Pump Co., Chicago, Ill.
Worthington Corp., Harrison, N. J.

PUMPS, STEAM

American-Marsh Pumps, Inc., Battle Creek, Mich.
Canton Stoker Corp., Canton, O.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Gardner-Denver Co., Quincy, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.

National Steam Pump Co., Upper Sandusky, O.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Union Steam Pump Co., Battle Creek, Mich.
Universal Mfg. Co., Berkeley, Calif.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.

PUMPS, SUMP

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes Mfg. Co., Mansfield, O.
Barrett Haentjens & Co., Hazleton, Pa.
Bruner Corp., Milwaukee, Wis.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Carver Pump Co., Muscatine, Ia.
Chicago Pneumatic Tool Co., New York.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
Dayton Electric Mfg. Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Duro Co., Dayton, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Friermood Machine Works, Converse, Ind.
Gardner-Denver Co., Quincy, Ill.
Gorman-Rupp Industries, Inc., Belleville, O.
Goulds Pump, Inc., Seneca Falls, N. Y.
Healey Co., Lee., Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Kol-Master Corp., Oregon, Ill
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pumps, Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Layne & Bowler, Inc., Memphis, Tenn.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Mall Tool Co., Div. of Remington Arms Co., Inc., Chicago, Ill.
Marlow Pumps, Division of Bell & Gossett Co., Ridgewood, N. J.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Myers & Bro. Co., F. E., The, Ashland, O.
Noera Mfg. Co., Div., Chase Brass & Copper Co., Waterbury, Conn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Peters-Dalton, Inc., Detroit, Mich.
Radiant Utilities Corp., Brooklyn, N. Y.
Red Jacket Mfg. Co., Davenport, Ia.
Robbins & Myers, Inc., Springfield, O.
Roth Co., Roy E., Rock Island, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skidmore Corp., St. Joseph, Mich.
Standard Electric Mfg. Co., West Berlin, N. J.
Sta-Rite Products, Inc., Delavan, Wis.
Swaby Mfg. Co., Chicago, Ill.
Taber Pump Co., Buffalo, N. Y.
Thor Power Tool Co., Aurora, Ill.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Uniflow Mfg. Co., Erie, Pa.
Union Steam Pump Co., Battle Creek, Mich.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Wade Mfg. Co., Elgin, Ill.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whitewater Pump Co., Inc., Whitewater, Wis.
Wintroath Pumps, Div. of Worthington Corp., Alhambra, Calif.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, SUMP, SUBMERSIBLE

Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Bruner Corp., Milwaukee, Wis.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Carver Pump Co., Muscatine, Ia.
Dayton Electric Mfg. Co., Chicago, Ill
Decatur Pump Co., Decatur, Ill.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pumps, Inc., Lawrence, Mass.
Mall Tool Co., Div. of Remington Arms Co., Inc., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Myers & Bro. Co., F. E., The, Ashland, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Swaby Mfg. Co., Chicago, Ill.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., Harrison, N. J.

PUMPS, TURBINE TYPE

Advance Pump Co., Berkeley, Calif.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Coffin Co., J. S., Jr., Englewood, N. J.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chem. Corp., Los Angeles, Calif.
Roth Co., Roy E., Rock Island, Ill.
Skidmore Corp., St. Joseph, Mich.
Sta-Rite Products, Inc., Delavan, Wis.
Universal Mfg. Co., Berkeley, Calif.
Wintroath Pumps, Div. of Worthington Corp., Alhambra, Calif.
Weinman Pump Mfg. Co., The, Columbus, O.
Worthington Corp., Harrison, N. J.

PUMPS, VACUUM

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Barrett Haentjens & Co., Hazleton, Pa.
Beach-Russ Co., New York, N. Y.
Bury Compressor Co., Erie, Pa.
Canton Stoker Corp., Canton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eisler Engineering Co., Inc., Newark, N. J.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Foster Wheeler Corp., New York, N. Y.
Fuller Co., Catasaqua, Pa.
Gardner-Denver Co., Quincy, Ill.
General Ceramics Corp., Keasbey, N. J. (Chemical alumina)
Granberg Corp., Oakland, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Joy Mfg. Co., Pittsburgh, Pa.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Oxygen Equipment & Service Co., Chicago, Ill.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Research Vacuum Supply Co., Chicago, Ill.
Roots-Connersville Blower Div., Connersville, Ind.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skidmore Corp., St. Joseph, Mich.
Sutorbilt Corp., Los Angeles, Calif.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Will Corp., Rochester, N. Y.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, VACUUM HEATING

American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Barnes & Jones, Inc., Newtonville, Mass.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Faber Engineering Co., Inc., Philadelphia, Pa.
Gardner-Denver Co., Quincy, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Sarco Co., Inc., New York, N. Y.
Skidmore Corp., St. Joseph, Mich.
Sterling, Inc., Milwaukee, Wis.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.

PUMPS, VISCOUS LIQUIDS AND HEAVY MATERIALS

Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Beach-Russ Co., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., Buffalo, N. Y.
C C Pump Mfg. Div., Palmyra, N. J.
Canton Stoker Corp., Canton, O.
Carver Pump Co., Muscatine, Ia.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.

Engineer Co., New York, N. Y.
Fairbanks, Morse & Co., Chicago, Ill.
Ferro Corp., Cleveland, O. (compressed air operated)
Foster Pump Wks., Inc., Brooklyn, N. Y.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Granberg Corp., Oakland, Calif.
Gray Co., Inc., Minneapolis, Minn.
Healey Co., Lee, Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lawrence Pumps, Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Madden Corp., The, Chicago, Ill.
Marco Co., Inc., Saginaw, Mich.
Milton Roy Co., Philadelphia, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Red Jacket Mfg. Co., Davenport, Ia.
Robbins & Myers, Inc., Springfield, O.
Rockwell Co., W. S., Fairfield, Conn.
Roots-Connersville Blower Div., Connersville, Ind.
Roper Corp., Geo. D., Rockford, Ill.
Royalton Co., Inc., Gasport, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Taber Pump Co., Buffalo, N. Y.
Tuthill Pump Co., Chicago, Ill.
Ulrich Mfg. Co., Bump Pump Div., Roanoke, Ill.
Union Steam Pump Co., Battle Creek, Mich.
United Centrifugal Pumps, Oakland, Calif.
Universal Mfg. Co., Berkeley, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Wheeler Mfg. Co., C. H., Economy Pump Div., Philadelphia, Pa.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUNCHES, SHEET METAL

Blackhawk Mfg. Co., Milwaukee, Wis.
Champion Blower & Forge Co., Lancaster, Pa.
Cleveland Punch & Shear Wks. Co., Cleveland, O.
Diamond Machine Tool Co., Pico, Calif.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Hendley & Whittemore Co., Beloit, Wis.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Leslie Welding Co., Inc., Chicago, Ill.
M-M-A, Inc., Lancaster, Pa.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Nye Tool Co., Chicago, Ill.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Reiner & Campbell Co., Inc., Newark, N. J.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Swaine Mfg. Co., Fred J., St. Louis, Mo.
Thor Tool & Die Co., San Leandro, Calif.
Webb Corp., The, Webb City, Mo.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.
Weidemann Machine Co., Philadelphia, Pa.
Zeh & Hahnemann Co., Newark, N. J.

PURGERS, REFRIGERANT GAS

Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesboro, Pa.
Mueller Brass Co., Port Huron, Mich.
Reco Products Div., Recony Corp., New York, N. Y.
Vilter Mfg. Co., Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

PUSHERS, PIPE, HYDRAULIC

Blackhawk Mfg. Co., Milwaukee, Wis.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Giant Mfg. Co., Council Bluffs, Ia.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Mercury Hydraulics, Inc., Denver, Colo.
Wilson Co., K. R., Arcade, N. Y.

RACKS, STORAGE, PIPE

Acme Steel Co., Chicago, Ill.
Adams Co., The, Dubuque, Ia.
Beaver Advance Corp., Ellwood City, Pa.
Berger Div., Republic Steel Corp., Canton, O.
Bernard-Franklin Co., Inc., Philadelphia, Pa.
California Steel Products Div., Richmond, Calif.
Haertel Co., Walter, Minneapolis, Minn.
Mult-A-Frame Div., Ainsworth Mfg. Corp., Detroit, Mich.
Palmer-Shile Co., Detroit, Mich.
Republic Steel Corp., Cleveland, O.
Steel City Electric Co., Pittsburgh, Pa.
Unistrut Products Co., Chicago, Ill.

RADIANT HEAT MEASUREMENT

See Radiometers

RADIANT HEAT THERMOSTATS

See Thermostats, Radiant Heat

RADIANT HEATING AND COOLING

See Coils and Panels, Radiant Heating, Prefabricated

RADIANT HEATING ELECTRICAL CONDUCTORS

See Conductors, Electrical, for Radiant Heating

RADIATION, BASEBOARD

For special fittings, see Fittings, Pipe, Special, for Baseboard Radiation

RADIATION, BASEBOARD, FERROUS

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Baseline Mfg. Corp., Minneapolis, Minn.
Burnham Corp., Irvington, N. Y.
Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Farrell Associates, Charles, Valencia, Pa.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
National-U. S. Radiator Corp., Johnstown, Pa.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Spi-Rol-Fin Corp., Pequannock, N. J.
Sterling Radiator Co., Inc., Westfield, Mass.
Trane Co., The, La Crosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
Utica Radiator Corp., Utica, N. Y.
Vulcan Radiator Co., Hartford, Conn.
Weil-McLain Co., Michigan City, Ind.

RADIATION, BASEBOARD, NON-FERROUS

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Argo Industries, Inc., Hartford, Conn.
Baseline Mfg. Corp., Minneapolis, Minn.
Beacon-Morris Corp., Boston, Mass.
Brown Products Corp., Forest Hills, N. Y.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Convector Corp. of America, Washington, D. C.
Crane Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Ejay Baseboard Mfg. Co., Winsted, Conn.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Farrell Associates, Charles, Valencia, Pa.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Federal Boiler Co., Inc., Midland Park, N. J.
General Automatic Products Corp., Baltimore, Md.
General Heating Products Co., Philadelphia, Pa.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Huron Boiler Co., Detroit, Mich.
Hydrotherm, Inc., Northvale, N. J.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Patco Mfg. Co., Philadelphia, Pa.
Radiant Baseboard Panels, Inc., Newington, Conn.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Rempe Co., Chicago, Ill.
Republic Products Co., Philadelphia, Pa.
Rittling Corp., Buffalo, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Spartan Convector Co., Inc., Maspeth, N. Y.
Spi-Rol-Fin Corp., Pequannock, N. J.
Stedco Products, Wilkes-Barre, Pa.
Sterling Radiator Co., Inc., Westfield, Mass.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Young Radiator Co., Racine, Wis.

RADIATION, CONVECTION TYPE, ELECTRIC HEATING ELEMENT

Circle-Air Industries, Inc., Brooklyn, N. Y.
Crystalheat Co., Van Nuys, Calif.
Electromode Div. of Commercial Controls Corp., Rochester, N. Y.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Meier Elec. & Mach. Co., Inc., Indianapolis, Ind.
Modernheat Cable Corp., Kingsport, Tenn.
National-U. S. Radiator Corp., Johnstown, Pa.
Paley Mfg. Corp., Brooklyn, N. Y.
Sunwarm, Inc., Kingsport, Tenn.
Thermador Electrical Mfg., Los Angeles, Calif.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.

RADIATION, CONVECTION TYPE, FERROUS

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Brown Fintube Co., The, Elyria, O.
Brown Products Corp., Forrest Hills, N. Y.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Rempe Co., Chicago, Ill.

Rittling Corp., The, Buffalo, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Tranter Mfg., Inc., Lansing, Mich.
Webster & Co., Warren, Camden, N. J.

RADIATION, CONVECTION TYPE, NON-FERROUS

Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Argo Industries, Inc., Hartford, Conn.
Beacon-Morris Corp., Boston, Mass.
Brown Fintube Co., The, Elyria, O.
Brown Products Corp., Forest Hills, N. Y.
Convector Corp. of America, Washington, D. C.
Dunham-Bush, Inc., West Hartford, Conn.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
General Heating Products Co., Philadelphia, Pa.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt Inc., John J., Philadelphia, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Patco Mfg. Co., Philadelphia, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Republic Products Co., Philadelphia, Pa.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Spartan Convector Co., Inc., Maspeth, N. Y.
Tenney Engineering Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Vapor Heating Corp., Chicago, Ill.
Webster & Co., Warren, Camden, N. J.
Young Radiator Co., Racine, Wis.

RADIATION, DIRECT

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Burnham Corp., Irvington, N. Y.
Clow & Sons, Inc., James B., Chicago, Ill. (Gas fired)
Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Rittling Corp, The, Buffalo, N. Y.
Utica Radiator Corp., Utica, N. Y.
Weil-McLain Co., Michigan City, Ind.
Wilson Engineering Corp., Chicago, Ill.

RADIATION, FIN TUBE TYPE

Alstrom Corp., New York, N. Y.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Argo Industries, Inc., Hartford, Conn.
Baseline Mfg. Corp., Minneapolis, Minn.
Brown Products Corp., Forest Hills, N. Y.
Convector Corp. of America, Washington, D. C.
Crane Co., Chicago, Ill.
Crystalheat Co., Van Nuys, Calif.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Div. of National U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
General Automatic Products Corp., Baltimore, Md.
General Heating Products Co., Philadelphia, Pa.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
Moore Dry Kiln Co., Jacksonville, Fla.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., Johnstown, Pa.
Radiant Baseboard Panels, Inc., Newington, Conn.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Spi-Rol-Fin Corp., Pequannock, N. J.
Stedco Products, Wilkes-Barre, Pa.
Sterling Radiator Co., Inc., Westfield, Mass.
Super Radiator Corp., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Vapor Heating Corp., Chicago, Ill.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
York-Shipley, Inc., York, Pa.

RADIATOR AND CONVECTOR HUMIDIFIERS

See Humidifiers for Radiators and Convectors

RADIATOR HANGERS

See Hangers or Brackets, Radiator

RADIATOR ORIFICES

See Orifices, Radiator

RADIATOR ORIFICE VALVES

See Valves, Radiator, Orifice

RADIATOR VALVES

See Valves, Radiator

RADIATOR VENT VALVE HUMIDIFIERS

See Humidifiers, Radiator Vent Valve

RADIATORS, ELECTRIC

Burnham Corp., Irvington, N. Y. (portable steam)
Crystalheat Co., Van Nuys, Calif.
Slant-Fin Radiator Corp., Richmond Hill, N. Y.
ThermoRay Corp., Newark, N. J.
Trent, Inc., Philadelphia, Pa.
Vulcan Radiator Co., Hartford, Conn.

RADIATORS, GAS FIRED

Clow & Sons, Inc., James B., Chicago, Ill.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.

RADIATORS, HUMIDIFYING

Murray Mfg. Co., D. J., Wausau, Wis.

RADIOACTIVE ISOTOPES FOR DETECTING LEAKS IN PIPING AND HEATING SYSTEMS

See Isotopes, Radioactive

RADIOMETERS, THERMAL, FOR RADIANT HEAT MEASUREMENTS

Beckman & Whitley, Inc., San Carlos, Calif.

RATCHET WRENCHES

See Wrenches, Ratchet

REAMERS, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Greenfield Tap & Die Corp, Greenfield, Mass.
Holub Industries, Inc., Sycamore, Ill.
Mueller Co., Decatur, Ill.
Nye Tool Co., Chicago, Ill.
Reed Mfg Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Thor Power Tool Co., Aurora, Ill.
Toledo Pipe Threading Machine Co., Toledo, O.

RECEIVERS, REFRIGERANT, LIQUID

Acme Industries, Inc., Jackson, Mich.
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa.
Killebrew Engineering Corp., St. Louis, Mo.
Remco, Inc., Zelienople, Pa.
Watkins Co., J. E., Maywood, Ill.
Worthington Corp., Harrison, N. J.

RECIPROCATING PUMPS

See Pumps, Reciprocating

RECORDER-CONTROLLERS, COMBINED TEMPERATURE AND HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDER-CONTROLLERS, HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDER-CONTROLLERS, PRESSURE

American Meter Co., Inc., Philadelphia, Pa.
Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.

Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Power Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDER-CONTROLLERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Electric Co., Inc., Saddle Brook, N. J.
Thwing-Albert Instrument Co., Philadelphia.
Tipp Manufacturing Co., Tipp City, O.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
West Insturment Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

RECORDER-TOTALIZERS, TIME, FOR HEATING SYSTEMS

Au-Temp Co. Corp., New York, N. Y.
Heat-Timer Corp., New York, N. Y.
Standard Instrument Div., Heat Timer Corp., New York, N. Y.

RECORDERS, CARBON DIOXIDE

Cole-Sewell Engineering Co., St. Paul, Minn.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Defender Instrument and Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Hays Corp., Michigan City, Ind.
Leeds & Northrup Co., Philadelphia, Pa.
Permutit Co., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.

RECORDERS, COMBINED TEMPERATURE AND HUMIDITY

Abbeon Supply Co., Jamaica, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Palmer Thermometers, Inc., Cincinnati, O.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDERS, DEW POINT

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Surface Combustion Corp., Toledo, O.

RECORDERS, DRAFT

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., Boody, Ill.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Republic Flow Meters Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J .
Victory Engineering Corp., Union, N. J.

RECORDERS, HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
Leeds & Northrup Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDERS, LIQUID LEVEL

Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp.; Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Liquidometer Corp., Long Island City, N. Y.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Uehling Instrument Co., Paterson, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa.
Yarnall-Waring Co., Philadelphia, Pa.

RECORDERS, OXYGEN

Bailey Meter Co., Cleveland, O.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Leeds & Northrup Co., Philadelphia, Pa.
Mine Safety Appliances Co., Pittsburgh, Pa.
Victory Engineering Corp., Union, N. J.

RECORDERS, PRESSURE AND VACUUM

American Meter Co., Inc., Philadelphia, Pa.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fischer & Porter Co., Hatboro, Pa.
Flow Corp., Cambridge, Mass.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Hagan Corp., Pittsburgh, Pa.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Swartwout Co., The, Cleveland, Ohio
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Uehling Instrument Co., Paterson, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electric Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

RECORDERS, SMOKE DENSITY

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia Pa.
Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.
De-Tec-Tronic Corp., Chicago, Ill.
Edwards, L. V., Rockville Center, N. Y.
Ess Instrument Co., Bergenfield, N. J.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Leeds & Northrup Co., Philadelphia, Pa.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Sterns-Flinn Corp., New York, N. Y.

RECORDERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
American Meter Co., Inc., Philadelphia, Pa.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Moore Products Co., Philadelphia, Pa.
Palmer Thermometers, Inc., Cincinnati (Norwood), O. (Mercury-actuated)
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.

Powers Regulator Co., Skokie, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Electric Co., Inc., Saddle Brook, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
Victory Engineering Corp., Union, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

RECORDING THERMOMETERS

See Recorders, Temperature

RECOVERY EQUIPMENT, AIR

See Adsorbers, Odor

REDUCERS AND INCREASERS, SPEED

Abart Gear & Machine Co., Chicago, Ill.
Adams Co., The, Dubuque, Iowa
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Bodine Electric Co., Chicago, Ill.
Boston Gear Wks., Quincy, Mass.
Brown-Brockmeyer Co., Inc., Dayton, O.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Cleveland Worm & Gear Co., Cleveland, O.
Cone-Drive Gears Div., Michigan Tool Co., Detroit, Mich.
De Laval Steam Turbine Co., Trenton, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Falk Corp., Milwaukee, Wis.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Hewitt-Robins, Inc., Stamford, Conn.
Janette Electric Mfg. Co., Morton Grove, Ill.
Jones Machinery Div., Hewitt-Robins, Inc., Chicago, Ill.
Lima Electric Motor Co., The, Lima, O.
Link Belt Co., Chicago, Ill.
Master Electric Co., Dayton, O.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Poole Foundry & Machine Co., Baltimore, Md.
Reliance Electric & Engineering Co., Cleveland, O.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Shallcross Controls, Inc., Milwaukee, Wis.
Star-Kimble Motor Div., Miehle Printing Press & Mfg. Co., Bloomfield, N. J.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Sterling Electric Motors, Inc., Los Angeles, Calif.
Terry Steam Turbine Co., The, Hartford, Conn.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.
Worthington Corp., Harrison, N. J.

REFRACTORIES AND REFRACTORY CEMENT

Allen Co., Robert G., Mechanicsville, N. Y.
Armstrong Cork Co., Lancaster, Pa.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Basic Inc., Cleveland, O.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Elraco Engineering Co., Los Angeles, Calif.
Fireline Stove & Furnace Lining Co., Chicago, Ill.
France Refractories, Co., J. H., Snow Shoe, Pa.
Green Fire Brick Co., Mexico, Mo.
Johns-Manville, New York, N. Y.
Monogram Products Co., Inc., Philadelphia, Pa.
Nebel Mfg. Co., Cleveland, O.
Norton Co., Worcester, Mass.
Plibrico Co., Chicago, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc, New York, N. Y.
Ramtite Co., The, Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y.
Reintjes Co., Geo. P., Kansas City, Mo.
Rex Clay Products Co., Detroit, Mich.
Robinson Clay Product Co., The, Akron, O.
Rutland Fire Clay Co., Rutland, Vt.
S.O.S. Products Co, Inc., Brooklyn, N. Y
Sauereisen Cements Co., Pittsburgh, Pa.
Saverite Engineering Co., Hoboken, N. J.
Standard Fuel Engineering Co., Detroit, Mich.
Taylor Sons Co., Charles, Cincinnati, O.
United States Stoneware Co., New York, N. Y.
Zonolite Co., Chicago, Ill.

REFRIGERANT DEHYDRATORS

See Dehydrators, Refrigerant

REFRIGERANT FILTERS

See Filters, Refrigerant

REFRIGERANT GAGE SETS

See Gage Sets, Refrigeration

REFRIGERANT GAS PURGERS

See Purgers, Refrigerant Gas

REFRIGERANT SLUG ELIMINATORS

See Eliminators, Slug, Refrigerant

REFRIGERANTS

American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif. (sulphur dioxide methyl chloride)
Ansul Chemical Co., Refrigeration Div., Marinette, Wis. (methyl, chloride, sulphur dioxide)
Armour and Co., Ammonia Div., Chicago, Ill. (Anhydrous ammonia)
Carrier Corp., Syracuse, N. Y. (carrene)
Dow Chemical Co., The, Midland, Mich.
du Pont de Nemours & Co., Inc., E. I., Electrochemicals Dept., Wilmington, Del. (Methyl chloride and methylene chloride)
du Pont de Nemours & Co., Inc., E. I., Kinetic Chemicals Div., Wilmington, Del. (fluorinated hydrocarbon refrigerants)
General Chemical Div., Allied Chemical & Dye Corp., New York, N. Y. (Trichloromonoflurومethane and dichlorodifluromethane, monochlorodifluoromethane, trichlorotrifluoroethane)
Liquid Carbonic Corp., Chicago, Ill. (carbon dioxide)
Monsanto Chemical Co., Merimac Div., Boston, Mass. (anhydrous ammonia)
Pennsylvania Salt Mfg. Co., Philadelphia, Pa. (ammonia, fluorinated hydrocarbons)
Pure Carbonic Co., Div. of Air Reduction Co., Inc., New York, N. Y. (carbon dioxide)
Virginia Smelting Co., West Norfolk, Va., (Methyl chloride, liquid sulphur dioxide.)

REFRIGERATING COMPRESSORS

See Compressors, Refrigerating

REFRIGERATION ACCUMULATORS

See Accumulators, Refrigeration

REFRIGERATION CONTROLS

See Valves, Refrigeration

REFRIGERATION FITTINGS

See Fittings, Refrigeration

REFRIGERATION MANIFOLDS

See Manifolds, Refrigeration

REFRIGERATION VALVES

See Valves, Refrigeration

REGISTERS

See also Diffusers; Grilles; Panels, Perforated, for Air Diffusion

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Auer Register Co., Cleveland, O.
Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.
Barber-Colman Co., Rockford, Ill.
Carnes Corp., Verona, Wis.
Char-Gale Mfg. Co., Minneapolis, Minn.
Controlair Mfg. Co., Los Angeles, Calif.
Diamond Mfg. Co., Wyoming, Pa.
Dole Valve Co., The, Morton Grove, Ill. (Automatic register)
Empire Ventilation Equipment Co., Long Island City, N. Y.
General Register Corp., Cedar Grove, N. J.
Harrington & King Perforating Co., Inc., Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Hastings Air Control, Inc., Omaha, Nebr.
Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland, O.
Krueger Air Conditioning Co., Tucson, Ariz.
Lima Register Co., The, Lima, O.
Louvra Mfg. & Sales Co., Union, N. J.
Midco Register Corp., St. Paul, Minn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Patco Mfg. Co., Philadelphia, Pa.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Standard Stamping & Perforating Co., Chicago, Ill.
Stewart Mfg. Co., Inc., Cedar Grove, N. J.
Super Steel Products Co., Milwaukee, Wis.
Thermo-Base Div., Gerwin Industries, Michigan City, Ind.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Viking Mfg. Corp., Cleveland, O.
Waterloo Register Co., Inc., Waterloo, Ia.
Young Regulator Co., Cleveland, O.

REGISTER UNITS, FOR SECONDARY AIR SUPPLY FOR OIL BURNERS

Engineer Co., New York, N. Y.
Faber Engineering Co., Inc., Philadelphia, Pa.
National Airoil Burner Co., Inc., Philadelphia, Pa.

REGULATORS, AIR VELOCITY

Ace Instrument Co., Inc., Brooklyn, N. Y.
Barber-Colman Co., Rockford, Ill.
General Register Corp., Cedar Grove, N. J.
Hastings-Raydist, Inc., Hampton, Va.
Hays Corp., Michigan City, Ind.
Johnson Service Co., Milwaukee, Wis.
Shallcross Controls, Inc., Milwaukee, Wis.
Taylor Instrument Companies, Rochester, N. Y.
Thermal Agency, Houston, Tex.

REGULATORS, DAMPER SETS

Ace Instrument Co., Inc., Brooklyn, N. Y.
Acme Mfg. Co., Philadelphia, Pa.
Adams Co., The, Dubuque, Ia.
Ashcraft Co., J. P., Dallas, Tex.
Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Crown Controls Co., Inc., New Bremen, O.
Defender Instrument & Regulator Co., Boody, Ill.
Detroit Controls Corp., Detroit, Mich.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Elgen Mfg. Co., Long Island City, N. Y.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Foster Wheeler Corp., New York, N. Y.
General Controls Co., Glendale, Calif. and Skokie, Ill. (electric)
Gerett Corp., M. A., Milwaukee, Wis.
Hagan Corp., Pittsburgh, Pa.
Hart & Cooley Mfg. Co., Holland, Mich.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford, Conn.
Penn Controls, Inc., Goshen, Ind.

Powers Regulator Co., Skokie, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Shallcross Controls, Inc., Milwaukee, Wis.
Thermal Agency, Houston, Tex.
United States Register Co., Battle Creek, Mich.
Wa-Trol, Houston, Tex.
Young Regulator Co., Cleveland, O.

REGULATORS, DRAFT, COMBUSTION

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Ace Instrument Co., Inc., Brooklyn, N. Y.
Askania Regulator Co., Chicago, Ill.
Automatic Devices Co., Inc., Western Springs, Ill.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cash Co., A. W., Decatur, Ill.
Cleveland Fuel Equipment Co., Cleveland, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Combustion Equipment Co., Moline, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
Engineer Co., New York, N. Y.
Ess Instrument Co., Bergenfield, N. J.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Foxboro Co., Foxboro, Mass.
Fuel Reduction Corp., Chicago, Ill.
Fuelguard Co., Dallas, Tex.
General Controls Co., Glendale, Calif.
Hays Corp., The, Michigan City, Ind.
Kol-Master Corp., Oregon, Ill.
Krueger Sentry Gauge Co., Green Bay, Wis.
Leahy Mfg. Co., Los Angeles, Calif.
Locke Regulator Co., Salem, Mass.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mirror Patented Stove Pipe Co., Hartford Conn.
Nichols Instrument Co., Baltimore, Md.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Republic Flow Meters Co., Chicago, Ill. (Industrial)
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Simplex Mfg. Co., Fond du Lac, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Webster Engineering Co., Tulsa, Okla.
Worner Electronic Devices, Rankin, Ill.

REGULATORS, FLUID FLOW, FOR CONSTANT VOLUME

Independent of Pressure

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Askania Regulator Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Binks Mfg. Co., Chicago, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Cla-Val Co., Newport Beach, Calif.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Gray Co., Inc., Minneapolis, Minn.
Hays Corp., Michigan City, Ind.
Henszey Co., Watertown, Wis.
Kates Co., W. A., The, Deerfield, Ill.
Klipfel Valves, Inc., Hamilton, O.
McDonnell & Miller, Inc., Chicago, Ill.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Taco Heaters, Inc., Cranston, R. I.

REGULATORS, LEVEL, LIQUID

Alco Valve Co., St. Louis, Mo.
Askania Regulator Co., Chicago, Ill.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Control Co., St. Paul, Minn.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Burrows Mfg. Co., F. A., York, Pa.
Cla-Val Co., Newport Beach, Calif.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument & Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Griscom-Russell Co., The, Massillon, O.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Henszey Co., Watertown, Wis.
Instruments, Inc., Tulsa, Okla.
Johnson Corp., The, Three Rivers, Mich.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Magnetrol, Inc., Chicago, Ill.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Petrometer Corp., Long Island City, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Stickle Steam Specialties Co., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.
United Electric Controls Co., Watertown, Mass.
Watts Regulator Co., Lawrence, Mass.

REGULATORS, PRESSURE, AIR

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Ace Instrument Co., Inc., Brooklyn, N. Y.
American Flow Control Corp., Houston, Tex.
American Meter Co., Inc., Philadelphia, Pa.
Askania Regulator Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Binks Mfg. Co., Chicago, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia.
Bryant Industrial Products Corp., Cleveland, O.
Burrows Mfg. Co., F. A., York, Pa.
CCA Products, Inc., Glendale, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument and Regulator Co., St.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
DeVilbiss Co., The, Toledo, O.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif.
Gray Co., Inc., Minneapolis, Minn.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hanna Engineering Wks., Chicago, Ill.
Hannifin Corp., DesPlaines, Ill.
Hays Corp., Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Nielan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Moore Products Co., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
National Cylinder Gas Co., Chicago, Ill.
Nielsen, Inc., E. V., Stamford, Conn.
Norgren Co., C. A., Englewood, Colo.
Norwalk Valve Co., Norwalk, Conn.
Penn Controls, Inc., Goshen, Ind.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Perfecting Service Co., Charlotte, N. C.
Powers Regulating Co., Skokie, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Smith Co., S. Morgan, York, Pa.
Smith Welding Equipment Corp., Minneapolis, Minn.
Spence Engineering Co., Inc., Walden, N. Y.
Spray Engineering Co., Somerville, Mass.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
United Electric Controls Co., Watertown, Mass.
Universal Controls Corp., Dallas, Tex.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Warren Engineering Co., Broadway, N. J.
Water Cooling Corp., New York, N. Y.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Young Regulator Co., Cleveland, O.

REGULATORS, PRESSURE, GAS

Ace Instrument Co., Inc., Brooklyn, N. Y.
Allen-Bradley Co., Milwaukee, Wis.
American Flow Control Corp., Houston, Tex.
American Meter Co., Inc., Philadelphia, Pa.

Askania Regulator Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Bryant Industrial Products Corp., Cleveland, O.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
Hays Corp., Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
K-G Equipment Co., Allentown, Pa.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Liquid Carbonic Corp., The, Chicago, Ill.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Maxitrol Co., Detroit, Mich.
McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Moore Products Co., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
National Cylinder Gas Co., Chicago, Ill.
North American Mfg. Co., Cleveland, O.
Norwalk Valve Co., South Norwalk, Conn.
Penn Controls, Inc., Goshen, Ind.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Refrigerating Specialties Co., Chicago, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Republic Flow Meters Co., Chicago, Ill. (Industrial)
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Smith Co., S. Morgan, York, Pa.
Smith Welding Equipment Corp., Minneapolis, Minn.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thermac Co., Los Angeles, Calif.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
Universal Controls Corp., Dallas, Tex.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Weldit, Inc., Detroit, Mich.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

REGULATORS, PRESSURE, HOT WATER HEATING SYSTEMS

Bailey Co., Chas., M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Boylston Steam Specialty Co., Chicago, Ill.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Burrows Mfg. Co., F. A., York, Pa.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Mfg. Co., Cleveland, O.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Defender Instrument and Regulator Co., Boody, Ill.
Detroit Controls Corp., Detroit, Mich.
Fisher Governor Co., Marshalltown, Ia.
Hays Corp., The, Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kehm Corp., The, Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Mueller Co., Decatur, Ill.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
White-Rodgers Co., St. Louis, Mo.

REGULATORS, PRESSURE, LIQUID

Allen-Bradley Co., Milwaukee, Wis.
American Flow Control Corp., Houston, Tex.
Askania Regulator Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Automatic Control Co., St. Paul, Minn.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Binks Mfg. Co., Chicago, Ill.
Blackmer Pump Co., Grand Rapids, Mich.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Cutler-Hammer, Inc., Milwaukee, Wis.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eddington Metal Specialty Co., Eddington, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Johnson Service Co., Milwaukee, Wis.
Jordan Corp., Div. of OPW Corp., Cincinnati.
Kaye & McDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
Norgren Co., C. A., Englewood, Colo.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Ruggles-Klingemann Mfg. Co., Boston, Mass. (industrial)
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
United Electric Controls Co., Watertown Mass.
Warren Engineering Co., Broadway, N. J.
Water Cooling Corp., New York, N. Y.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
White-Rodgers Co., St. Louis, Mo.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (Feed water)

REGULATOR, STATIC PRESSURE, AIR DUCT

Ace Instrument Co., Inc., Brooklyn, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Daytronic Corp., Dayton, O.
General Controls Co., Glendale, Calif.
Hays Corp., Michigan City, Ind.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Shallcross Controls, Inc., Milwaukee, Wis.
Weston Electrical Instrument Co., A Subsidiary of Daystrom, Inc., Newark, N. J.

REGULATORS, TEMPERATURE

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Aerco Corp., Northvale, N. J.
Allen-Bradley Co., Milwaukee, Wis.
American Instrument Co., Inc., Silver Spring, Md.
Atlas Valve Co., Newark, N. J.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Cash Co., A. W., Decatur, Ill.
Century Instrument Co., Detroit, Mich.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Crown Controls Co., Inc., New Bremen, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Dahl, G. W., Bristol, R. I.
Defender Instrument and Regulator Co., Boody, Ill.

d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Detroit Controls Corp., Detroit, Mich.
Eclipse Fuel Engineerig Co., Rockford, Ill.
Fenwal Inc., Ashland, Mass.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
H-B Instrument Co., Philadelphia, Pa.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Kaye & McDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Skokie, Ill.
Klipfel Valves, Inc., Hamilton, O.
Lawler Automatic Controls, Inc., Mount Vernon, N. Y.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McAlear Mfg. Co., Chicago, Ill.
McCorkle Co., D. H., Berkeley, Calif.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Co., Skokie, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc, New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Squires Co., C. E. The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Co., Chicago, Ill.
White-Rodgers Co., St. Louis, Mo. (Hydraulic-Action)

RELAYS, ELECTRICAL

A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J. (time delay)
Advance Relays, Product of Electronics Div., Elgin National Watch Co., Burbank, Calif.
Aemco Inc., Mankato, Minn.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Allen-Bradley Co., Milwaukee, Wis.
Allied Control Co., Inc., New York, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Au-Temp-Co Corp., New York, N. Y.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Bristol Co., The, Waterbury, Conn.
Burke Engineering, Los Angeles, Calif.
Clark Controller Co., Cleveland, O.
Consolidated Metal Products Corp., Albany, N. Y.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cook Electric Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Deltron, Inc., Philadelphia, Pa.
Detroit Controls Corp., Detroit, Mich.
Ebert Electronics Corp., Queens Village, N. Y.
Edison, Inc., Thos. A., Instrument Div., West Orange, N. J.
Electro-Switch & Controls, Inc., Culver City, Calif.
Ess Instrument Co., Bergenfield, N. J.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
H-B Instrument Co., Philadelphia, Pa.
Hart Mfg. Co., The, Hartford, Conn.
Haydon Co., A. W., Waterbury, Conn.
International Business Machines Corp., New York, N. Y.
Leach Relay Co., Los Angeles, Calif.
McCorkle Co., D. H., Berkeley, Calif.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis; Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monitor Controller, Rockland, Mass.
National Time & Signal Corp., Detroit, Mich.
Penn Controls, Inc., Goshen, Ind.
Philadelphia Thermometer Co., Philadelphia.
Potter & Brumfield Sales Co., Inc., Princeton, Ind.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Simpson Electric Co., Chicago, Ill.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass. (motor starting relays)
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Struthers-Dunn, Inc., Pitman, N. J.
Synchro-Start Products, Inc., Skokie, Ill.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Vapor Heating Corp., Chicago, Ill.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
White-Rodgers Co., St. Louis, Mo.
Zenith Electric Co., Chicago, Ill.

RELAYS, PNEUMATIC

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Cutler-Hammer, Inc., Milwaukee, Wis.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Trerice Co., H. O., Detroit, Mich.

RELIEF VALVES

See Valves, Relief

REPAIR CLAMPS

See Clamps, Pipe Repair

REPAIR PLUGS FOR TANKS

See Plugs, Repair, for Tanks

RESEATERS, VALVE

Chicago Specialty Mfg. Co., Chicago, Ill.
Economy Valve Seat Co., Chicago, Ill.
Leavitt Machine Co., Orange, Mass.
Skinner Co., M. B., South Bend, Ind.
Standard Reseater Co., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Thor Power Tool Co., Aurora, Ill.

REVERSE REFRIGERATION CYCLE UNITS

See Units, Air Conditioning, Reverse Refrigeration Cycle

RINGS, PISTON, FOR COMPRESSORS

Koppers Company, Inc., Metal Products Div., Baltimore, Md.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Perfect Circle Corp., Hagerstown, Ind.
Sealed Power Corp., Muskegon, Mich.

RINGS, WELDING

Alco Products, Inc., Schenectady, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Arcos Corp., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Midwest Piping Co., Inc., St. Louis, Mo.
Robvon Backing Ring Co., Elizabeth, N. J.
Stainless Processing Div., Wall Colmonoy Corp., Detroit, Mich.
Tube Turns, A Div. of National Cylinder Gas. Co., Louisville, Ky.
Wedge Protectors, Inc., Cleveland, O.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.

ROD, GAS WELDING

Air Reduction Co., Inc., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
American Steel & Wire Div., United States Steel, Cleveland, O.
Arcos Corp., Philadelphia, Pa.
Atlantic Steel Co., Atlanta, Ga.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Crucible Steel Co. of America, Pittsburgh, Pa.
Dow Chemical Co., The, Midland, Mich.
Duraloy Co., Scottdale, Pa. (Stainless)
Eutectic Welding Alloys Corp., Flushing, N. Y.
International Nickel Co., The, New York, N. Y.
K-G Equipment Co., Allentown, Pa.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Maurath, Inc., Cleveland, O.
Metal & Thermit Corp., Rahway, N. J.
Mir-O-Col Alloy Co., Los Angeles, Calif. (for hard facing)
National Cylinder Gas Co., Chicago, Ill.
Page Steel & Wire Division of American Chain & Cable Co., Inc., Monessen, Pa.
Revere Copper and Brass, Inc., New York, N. Y.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.
Youngstown Sheet & Tube Co., Youngstown, O.

ROLLER BEARINGS

See Bearings, Roller

ROOF COOLERS

See Systems, Roof Spraying

ROOF SPRAYING SYSTEMS

See Systems, Roof Spraying

ROOF VENTILATORS

See Ventilators, Roof

ROOM HUMIDIFIERS

See Humidifiers, Unit, Room Type; and Units, Air Conditioning, Winter

ROOM THERMOSTATS

See Thermostats, Room or Wall

ROTARY PUMPS

See Pumps, Rotary

RUBBER BELTING

See Belting, Flat, Rubber

RUBBER PACKING
See Packing, Rubber and Synthetic

RUBBER PIPE
See Pipe, Hard Rubber

SADDLE VALVES
See Valves, Saddle

SADDLE TEES
See Fittings, Pipe, Saddle Tee

SAFETY VALVES
See Valves, Safety, Steam

SALAMANDERS
See Heaters, Air, Direct Fired, Portable

SAWS, ELECTRIC, PORTABLE
Albertson & Co., Inc., Sioux City, Ia.
Black & Decker Mfg. Co., The, Towson, Md.
Eveready Briksaw Co., Chicago, Ill. (for concrete)
Key-Hak Div., Producers & Distributors, Inc., Allentown, Pa.
Mall Tool Co., Div. of Remington Arms Co., Inc., Chicago, Ill.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Oster Mfg. Co., John, Milwaukee, Wis.
Portable Electric Tools, Inc., Chicago, Ill.
Porter-Cable Machine Co., Syracuse, N. Y.
R C S Tool Corp., Bloomington, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago (Cicero), Ill.
Stanley Works, The, New Britain, Conn.
Syntron Co., Homer City, Pa.
Thor Power Tool Co., Aurora, Ill.
United States Electrical Tool Co., Cincinnati, O.
Wallace Supplies Mfg. Co., Chicago, Ill. (for abrasive materials)

SCAFFOLDS, PORTABLE
American Ladder & Scaffold Co., Inc., Miami, Fla.
Beaver-Advance Corp., Ellwood City, Pa.
Waco Steel Scaffolding, Inc., Waco, Tex.

SCALE CONTROL
See Devices, Electrolytic; Treatment, Steam System; Treatment, Water

SCALE REMOVAL, CHEMICAL SERVICE FOR
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Brown-Electro Co., Oklahoma City, Okla. (electrolytic protector)
Calgon, Inc., Pittsburgh, Pa.
Chemical Solvent Co., Birmingham, Ala.
Dearborn Chemical Co., Chicago, Ill.
Dowell Inc., Tulsa, Okla.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y
Smith Chemical Co., E. W., La Puente, Calif.
Virginia Smelting Co., West Norfolk, Va.

SCOOPS, AIR, FOR DEFLECTING FLOW IN DUCTS
General Register Corp., Cedar Grove, N. J.
Stewart Mfg. Co., Inc., Cedar Grove, N. J.
Titus Mfg. Corp., Waterloo, Ia.
Waterloo Register Co., Inc., Waterloo, Ia.

SCREENS, SUN REFLECTING
Kaiser Aluminum & Chemical Sales, Inc., Chicago, Ill.
Kane Mfg. Corp., Kane, Pa.
Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.

SCREWS, SHEET METAL
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Screw Co., Willimantic, Conn.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Continental Screw Co., New Bedford, Mass.
Elco Tool & Screw Corp., Rockford, Ill.
Harper Co., H. M., Morton Grove, Ill.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
National Lock Co., Inc., Rockford, Ill.
Paine Co., Addison, Ill.
Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.
Pheoll Mfg. Co., Chicago, Ill.
Rockford Screw Products Co., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Shakeproof Div., Illinois Tool Wks., Elgin, Ill.
Star Stainless Screw Co., Paterson, N. J.
United States Register Co., Battle Creek, Mich.

SEALS, SHAFT, MECHANICAL
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., Los Angeles, Calif.
Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.
Crane Packing Co., Morton Grove, Ill.
Felt Products Mfg. Co., Chicago, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Garlock Packing Co., Palmyra, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Magnetic Seal Corp., Barrington, R. I.
Morganite, Inc., Carbon Specialties Div., Long Island City, N. Y.
Rotary Seal Div., Muskegon Piston Ring Co., Chicago, Ill.
Schwitzer Corp., Indianapolis, Ind.
Sealol Corp., Providence, R. I.
Syntron Co., Homer City, Pa.
United States Gasket Co., Camden, N. J.
Wolfe Co., Inc., The Franklin C., Culver City, Calif.

SEALS, TERMINAL, FOR COMPRESSORS
Minnesota Rubber & Gasket Co., Minneapolis, Minn.
Wolfe Co., Inc., The, Franklin C., Culver City, Calif.

SEAMLESS PIPE
See Pipe, Steel, Seamless

SEPARATORS, AIR
ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Adams Co., Inc., R. P., Buffalo, N. Y.
American District Steam Div., ADSCO Industries Inc., Buffalo, N. Y.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Automatic Switch Co., Orange, N. J.
Binks Mfg. Co., Chicago, Ill.
Buxton Mfg. Co., Dover, N. J.
Centrifix Corp., Cleveland, O.
Clark Mfg. Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Crane Co., Chicago, Ill.
DeVilbiss Co., The, Toledo, O.
Dollinger Corp., Rochester, N. Y.
Dunham-Bush, Inc., West Hartford, Conn.
Gray Co., Inc., Minneapolis, Minn.
Hagan Corp., Pittsburgh, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Corp., Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Kice Metal Products Co., Wichita, Kans.
Kraissl Co., Inc., The, Hackensack, N. J.
Leavitt Machine Co., Orange, Mass.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Quality Specialty Co., Inc., Camden, N. J.
Spencer Turbine Co., Hartford, Conn.
Spray Engineering Co., Somerville, Mass.
Strong, Carlisle & Hammond, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Vortox Co., Claremont, Calif.
Watts Regulator Co., Lawrence, Mass.
Wright-Austin Co., Detroit, Mich.

SEPARATORS, BLOWDOWN
Wilson Engineering Corp., Chicago, Ill.

SEPARATORS, FLANGE
Williams & Co., J. H., Buffalo, N. Y.

SEPARATORS, OIL
ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Acme Industries, Inc., Jackson, Mich.
Adams Co., Inc., R. P., Buffalo, N. Y.
Air-Maze Corp., Cleveland, O.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Boylston Steam Specialty Co., Chicago, Ill.
Centrifix Corp., Cleveland, O. (Gas and Vapor)
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crane Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Graver Water Conditioning Co., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Heat-X, Inc., Brewster, N. Y.
Hoppes Mfg. Co., Inc., Springfield, O.
Howe Ice Machine Co., Chicago, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Corp., The, Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
King Zeero Co., The, Chicago, Ill.
Kraissl Co., Inc., The, Hackensack, N. J.
Morehead Mfg. Co., Detroit, Mich.
National Valve & Mfg. Co., Pittsburgh, Pa.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Richmond Engineering Co., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond, Cleveland, O.
Techniflex Corp., Port Jervis, N. Y.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
Wright-Austin Co., Detroit, Mich.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

SETS, PIPE BIT, FOR BORING HOLES IN WOOD FOR PIPE AND TUBING
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.

SEWAGE EJECTORS
See Ejectors, Sewage

SEWAGE PUMPS
See Pumps, Sewage

SHAFT SEALS, MECHANICAL
See Seals, Shaft, Mechanical

SHAFTS, FLEXIBLE, PUSH-PULL, FOR CONTROL
Albertson & Co., Inc., Sioux City, Ia.
Arens Controls, Inc., Evanston, Ill.
Atmos Corp., Chicago, Ill.
Healey Co., Lee, Glendale, Calif.
Imperial Brass Mfg. Co., Chicago, Ill.
Piezo Mfg. Corp., Staten Island, N. Y.
Teleflex Incorporated, North Wales, Pa.

SHEARS, ELECTRICAL, PORTABLE
Black & Decker Mfg. Co., Towson, Md.
M-M-A, Inc., Lancaster, Pa.

Mall Tool Co., Div. of Remington Arms Co., Inc., Chicago, Ill.
Miller Falls Co., Greenfield, Mass.
Skil Corp., Chicago, Ill.
Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Stanley Works, The, New Britain, Conn.
Thor Power Tool Co., Aurora, Ill.

SHEARS, POWER

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bertsch & Co., Inc., Cambridge City, Ind.
Beverly Shear Mfg. Co., Chicago, Ill.
Buckeye Tools Corp., Dayton, O.
Buffalo Forge Co., Buffalo, N. Y. (portable)
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Crane & Eng. Co., Wickliffe, O.
Cleveland Punch & Shear Works Co., Cleveland, O.
Diamond Machine Tool Co., Pico, Calif.
Famco Machine Co., Kenosha, Wis.
H-A Mfg. Co., York, Pa.
Hendley & Whittemore, Beloit, Wis.
Kling Bros. Engineering Works, Chicago, Ill. (rotary) (double angle)
Libert Machine Co., Green Bay, Wis.
Mall Tool Co., Div. of Remington Arms Co., Inc., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Quickwork Div., Whiting Corp., Harvey, Ill.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
St. Louis Tool Co., St. Louis, Mo.
Stamco Inc., New Bremen, Ohio
Whiting Corp., Harvey, Ill.
Whitney Metal Tool Co., Rockford, Ill.
Wysong & Miles Inc., Greensboro, N. C.

SHEARS AND SNIPS, HAND

Barlett Mfg. Co., Detroit, Mich.
Basford Co., H. R., San Francisco, Calif.
Beverly Shear Mfg. Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Black & Decker Mfg. Co., Towson, Md. (electrically driven)
Bremil Mfg. Co., Erie, Pa.
Champion Blower & Forge Co., Lancaster, Pa.
Clauss Cutlery Co., Fremont, O.
Crescent Tool Co., Jamestown, N. Y.
Kidder Mfg. Co., Inc., J. F. Burlington, Vt.
Klenk's Aviation Snips, Wilmington, Del.
Lidseen, Inc., Gustave, Hayesville, N. C.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Snap-on Tools Corp., Kenosha, Wis.
Thor Tool & Die Co., San Leandro, Calif.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.
Wiss & Sons Co., J., Newark, N. J.

SHEAVES

See Pulleys and Sheaves, for Belt Drives

SHEET METAL BRAKES

See Brakes, Sheet Metal

SHEET METAL DUCTS

See Ducts and Duct Fittings, Prefabricated Non-Flexible

SHEET METAL FITTINGS

See Ducts and Duct Fittings, Prefabricated Non-Flexible

SHEET METAL PUNCHES

See Punches, Sheet Metal

SHEETS, ALUMINUM

Aluminum Co. of America, Pittsburgh, Pa.
American Nickeloid Co., Peru, Ill. (Nickel and chromium plated)
Brass & Copper Imports, Inc., Minneapolis, Minn.
Central Steel & Wire Co., Chicago, Ill.
Fairmont Aluminum Co., Fairmont, W. Va.
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa. (for pipe covering)
Kaiser Aluminum & Chemical Sales, Inc., Chicago, Ill.
Mueller Brass Co., Port Huron, Mich.
Revere Copper and Brass, Inc., New York.
Reynolds Metals Co., Louisville, Ky.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, ALUMINUM COATED

Armco Steel Corp., Middletown, O.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Rigidized Metals Corp., Buffalo, N. Y.
United States Steel Corp., Pittsburgh, Pa.

SHEETS AND BOARD, NON-METALLIC (OTHER THAN PLASTIC), FOR DUCT CONSTRUCTION

Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Celotex Corp., The, Chicago, Ill.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Keystone Asphalt Products Co., Chicago, Ill.
Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.
Ruberoid Co., New York, N. Y.
Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O.
Technical Ply-Wood Sales, Chicago, Ill.

SHEETS, CLAD

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
Aluminum Co. of America, Pittsburgh, Pa.
American Nickeloid Co., Peru, Ill.
Bart Mfg. Corp., Belleville, N. J.
Bridgeport Brass Co., Bridgeport, Conn. (laminates)
Central Steel & Wire Co., Chicago, Ill. (aluminum)
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill. (stainless)
Jessop Steel Co., Washington, Pa.
Lukens Steel Co. and Divisions, Coatesville, Pa.
Republic Steel Corp., Cleveland, O.
Revere Copper & Brass, Inc., New York.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, COPPER

American Brass Co., Waterbury, Conn.
American Nickeloid Co., Peru, Ill. (Nickel and chromium plated)
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Hussey & Co., C. G., Div. of Copper Range Co., Pittsburgh, Pa.
Inland Steel Products Co., Milwaukee, Wis.
New Haven Copper Co., The, Seymour, Conn.
Olin Mathieson Chemical Corp., Western Brass Mills Div., East Alton, Ill. (Brass, bronze, super X, phosphor bronze)
Revere Copper & Brass, Inc., New York.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, LEAD

Alpha Metals, Inc., Jersey City, N. J.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Bunker Hill Co., The, Sales & Fabrication Div., Seattle, Wash.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Gardiner Metal Co., Chicago, Ill.
National Lead Co., New York, N. Y.
Revere Copper & Brass, Inc., Standard Rolling Mills Div., Brooklyn, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.
Rochester Lead Wks., Inc., Rochester, N. Y.

SHEETS, MAGNESIUM ALLOY

Dow Chemical Co., The, Midland, Mich.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, METAL, WITH PROTECTIVE NON-METALLIC COATING

American Nickeloid Co., Peru, Ill.
American Steel Band Co., Pittsburgh, Pa.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Cheney Flashing Co., Trenton, N. J.
Pittsburgh Steel Co., Pittsburgh, Pa.
Plasteel Products Corp., Washington, Pa.
Rigidized Metals Corp., Buffalo, N. Y.
Robertson Co., H. H., Pittsburgh, Pa.
Technical Ply-Wood Sales, Chicago, Ill. (Metal and plywood)

SHEETS, NICKEL AND NICKEL ALLOY

American Nickeloid Co., Peru, Ill.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
International Nickel Co., Inc., The, New York, N. Y.
Lukens Steel Co. and Divisions, Coatesville, Pa.
Olin Mathieson Chemical Corp., Western Brass Mills Div., East Alton, Ill.
Revere Copper and Brass, Inc., New York, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, PLASTIC, FOR DUCTS AND HOODS

Atlas Mineral Products Co., Mertztown, Pa.
Bakelite Co., Div. of Union Carbide & Carbon Chemical Co., New York, N. Y.
Campco Div., Chicago Molded Products Corp., Chicago, Ill.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Colonial Plastics Mfg. Co., Cleveland, O. (Polyvinyl chloride)
Corite Products, Inc., Chicago, Ill.
Formica Corp., The, Cincinnati, O.
Goodrich Industrial Products Co., B. F., Akron, O. (rigid)
Goodrich Industrial Products Co., B. F., Plastics Products, Marietta, O. (PVC)
Hartwell & Son, Inc., H. N., Boston, Mass. (PVC)
Haveg Industries, Inc., Newark, Del.
Heil Process Equipment Corp., Cleveland, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Kaykor Industries, Inc., Yardville, N. J.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Naugatuck Chemical Div., United States Rubber Co., Naugatuck, Conn.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.
Resolite Corp., Zelienople, Pa.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Seelye Craftsman, Minneapolis, Minn.
Seiberling Rubber Co., Plastics Div., Newcomberstown, O.
Southern Plastics Co., Columbia, S. C.

SHEETS, STEEL, COPPER BEARING

Alan Wood Steel Co., Conshohocken, Pa.
Armco Steel Corp., Middletown, O.
Berger Div., Republic Steel Corp., Canton, O.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel & Wire Co., Chicago, Ill.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Granite City Steel Co., Granite City, Ill.
Great Western Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Inland Steel Products Co., Milwaukee, Wis.
Lukens Steel Co. and Divisions, Coatesville, Pa.
Newport Steel Corp., Newport, Ky.
Pittsburgh Steel Co., Pittsburgh, Pa.
Reeves Steel & Mfg. Co., Dover, O.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, STEEL, GALVANIZED
Armco Steel Corp., Middletown, O.
Berger Div., Republic Steel Corp., Canton, O.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel & Wire Co., Chicago, Ill.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Granite City Steel Co., Granite City, Ill.
Great Western Steel Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Inland Steel Products Co., Milwaukee, Wis.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Newport Steel Corp., Newport, Ky.
Reeves Steel & Mfg. Co., Dover, O.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son. Inc., Joseph T., Chicago, Ill.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.

SHEETS, STEEL, GALVANNEALED
American Agile Corp., Bedford, O. (sheets plastic)
Berger Div., Republic Steel Corp., Canton, O.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Great Western Steel Co., Chicago, Ill.
Newport Steel Corp., Newport, Ky.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sharon Steel Corp., Sharon, Pa.
United States Steel Corp., Pittsburgh, Pa.

SHEETS, STEEL, STAINLESS
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
American Nickeloid Co., Peru, Ill.
Armco Steel Corp., Middletown, O.
Berger Div., Republic Steel Corp., Canton, O.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Crucible Steel Co. of America, Pittsburgh, Pa.
Eastern Stainless Steel Corp., Baltimore, Md.
Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill.
Jessop Steel Co., Washington, Pa.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Washington Steel Corp., Washington, Pa.

SHEETS, ZINC
American Nickeloid Co., Peru, Ill. (Nickel and chromium plated)
American Zinc Products Div., Ball Brothers Co., Greencastle, Ind.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Division Lead Co., Summit, Ill.
Illinois Zinc Co., Div. of Hydrometals, Inc., Chicago, Ill.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Co., New York, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.

SHIELDS, CORROSION, FOR PIPE JOINTS
Atlas Mineral Products Co., Mertztown, Pa.

SHIELDS, VALVE BONNET
Industrial Products Co., Philadelphia, Pa.
Wilmington Plastics Co., Wilmington, Del.

SHOCK ABSORBERS, LIQUID
See Absorbers, Shock, Liquid

SHUTTERS
See Louvers and Shutters

SIGHT GLASSES
See Glasses, Sight, for Pipe Lines

SIGNALS, LIQUID LEVEL
See Alarms, Liquid Level

SIGNALS, TANK FILL
See Alarms, Liquid Level

SILENCERS FOR REDUCING COMPRESSOR INTAKE NOISE
Air-Maze Corp., Cleveland, O.
Dollinger Corp., Rochester, N. Y.

SLEEVE BEARINGS
See Bearings, Sleeve

SLEEVES, PIPE REPAIR
See Clamps, Pipe Repair

SLIME AND ALGAE CONTROL, WATER TREATMENT FOR
See Treatment, Water, for Slime and Algae Control

SMOKE ALARMS
See Alarms, Smoke

SMOKE ELIMINATORS
See Jets, Overfire Air, for Smoke Abatement

SMOKE GUNS
See Guns, Pots and Candles, Smoke and Smudge

SMUDGE POTS
See Guns, Pots and Candles, Smoke and Smudge

SNOW MELTING ANTI-FREEZE
See Compounds, Anti-Freeze

SOFTENERS, WATER
Alrose Chemical Co., Providence, R. I.
American Water Softener Co., Philadelphia.
American Well Works, Aurora, Ill.
Anderson-Stolz Corp., Kansas City., Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Bruner Corp., Milwaukee, Wis.
Cochrane Corp., Philadelphia, Pa.
Culligan, Inc., Norbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Duro Co., Dayton, O.
Elgin Softener Corp., Elgin, Ill.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Modern Div., George Getz Corp., Rockford, Ill.
Myers & Bro. Co., F. E., The, Ashland, O.
Norwood Associated Engineers Inc., Springfield, Mass.
Oakite Products, Inc., New York, N. Y.
Oshkosh Filter & Softener Co., Oshkosh, Wis.
Permutit Co., New York, N. Y.
Red Jacket Mfg. Co., Davenport, Ia.
Reynolds Shaffer Co., Detroit, Mich.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Stover Water Softener Co., St. Charles, Ill.
Uniflow Mfg. Co., Erie, Pa.

SOLAR HEAT REFLECTORS
See Canopies, Metal, Sun, Reflecting

SOLAR HEAT RESISTING LOUVERS AND SCREENS
See Louvers, Sun Reflecting; and Screens, Sun Reflecting

SOLDER (SILVER), BRAZING ALLOYS, AND FLUXES
Air Reduction Co., Inc., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allen Co., Inc., L. B., Chicago, Ill.
Alpha Metals, Inc., Jersey City, N. J.
American Platinum Works, Newark, N. J.
Anchor Metal Co., Inc., Brooklyn, N. Y.
Baker & Co., Inc., Newark, N. J.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Eutectic Welding Alloys Corp., Flushing, N. Y.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Handy & Harman, New York, N. Y.
Hi-Grade Alloy Corp., Chicago, Ill.
Industrial Service Laboratories, Milwaukee.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif.
Mueller Brass Co., Port Huron, Mich.
National Cylinder Gas Co., Chicago, Ill.
Oxygen Equipment & Service Co., Chicago.
Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., Ossining, N. Y.
Stainless Processing Div., Wall Colmonoy Corp., Detroit, Mich.
Sulflo, Inc., Elizabeth, N. J.
Wabash Corp., Chicago, Ill.
Weldit, Inc., Detroit, Mich.

SOLDER (TIN-LEAD), AND FLUXES
Allen Co., Inc., L. B., Chicago, Ill.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Alpha Metals, Inc., Jersey City, N. J.
American Sanitary Mfg. Co., Abingdon, Ill.
American Solder & Flux Co., Philadelphia, Pa.
Anchor Metal Co., Inc., Brooklyn, N. Y.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Benson Co., Inc., Alex R., Hudson, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Bohn Aluminum & Brass Corp., Detroit, Mich.
Bunker Hill Co., The, Sales & Fabrication Div., Seattle, Wash.
Chase Brass & Copper Co., Waterbury, Conn.
Division Lead Co., Summit, Ill.
du Pont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington, Del.
Eutectic Welding Alloys Corp., Flushing, N. Y.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Fluxolder Products Co., Detroit, Mich., (solder paints)
Gardiner Metal Co., Chicago, Ill.
Helmco, Inc., Chicago, Ill.
Hercules Chemical Co., Inc., New York, N. Y.
Hi-Grade Alloy Corp., Chicago, Ill.
Industrial Service Laboratories, Milwaukee, Wis.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Johnson Foil Mfg. Co., The, St. Louis, Mo.
Kester Solder Co., Chicago, Ill.
Klauer Mfg. Co., Dubuque, Ia.
Lake Chemical Co., Chicago, Ill. (fluxes in paste, stik & liquid form)
Lenk Mfg. Co., Boston, Mass.
London Chemical Co., Melrose Park, Ill.
Mill-Rose Co., Cleveland, O.
Mueller Brass Co., Port Huron, Mich.
National Lead Co., New York, N. Y.
Paul-Lewis Laboratories, Inc., Milwaukee, Wis.
Potts-Farrington Co., Philadelphia, Pa.
Revere Copper & Brass, Inc., Standard Rolling Mills Div., Brooklyn, N. Y.
Rochester Lead Works, Inc., Rochester, N. Y.
Rotometals, San Francisco, Calif.
Ruby Chemical Co., Columbus, O.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., Ossining, N. Y.
Sulflo, Inc., Elizabeth, N. J.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

SOLENOIDS AND SOLENOID COILS
A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Allen-Bradley Co., Milwaukee, Wis.
Automatic Switch Co., Orange, N. J.
Controls Co. of America, Soreng Div., Schiller Park, Ill.

Cook Electric Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Dole Valve Co., The, Morton Grove, Ill.
Dormeyer Industries, Chicago, Ill.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
Hammett Electric Mfg. Co., Kansas City, Mo.
Hubbell Corp., Mundelein, Ill.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
McDonnell & Miller, Inc., Chicago, Ill.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Monitor Controller, Rockland, Mass.
National Acme Co., The, Cleveland, O.
Struthers-Dunn, Inc., Pitman, N. J.
Synchro-Start Products, Inc., Skokie, Ill.
Trombetta Solenoid Corp., Milwaukee, Wis.

SOLENOID VALVES

See Valves, Solenoid

SOLVENT, PENETRANT, FOR LOOSENING THREADED JOINTS

Hercules Chemical Co., Inc., New York, N. Y.
National Pipe Coatings, Inc., Huntington Park, Calif.
Permatex Co., Inc., Brooklyn, N. Y.
Petroleum Solvents Corp., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Sealed Unit Parts Co., Inc., Bronx, N. Y.

SOOT BLOWERS

See Blowers, Soot

SOOT DESTROYERS

See Destroyers, Soot, Chemical

SOUND CONTROL FOR COOLING TOWERS

See Noise Elimination for Cooling Towers

SOUND DEADENING FOR DUCTS

See Insulation, Duct, Sound Deadening

SOUND INDICATORS

See Indicators, Sound Level

SOUND TESTERS FOR LOCATING MECHANICAL TROUBLES

See Testers, Sound

SPARGER NOZZLES

See Nozzles, Sparger, for Tank Heating

SPEED CHANGERS

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical

SPEED REDUCERS

See Reducers, Speed

SPIRAL PIPE

See Pipe, Spiral, Riveted and Welded

SPOT WELDERS

See Welders, Spot

SPRAY HUMIDIFIERS

See Humidifiers, Direct, Spray Head

SPRAY NOZZLES

See Nozzles, Spray

SPRAY PAINTING BOOTHS

See Booths, Painting, Spray

SPRINKLER HEADS

See Heads, Sprinkler

SPRINKLER SYSTEM CONTROLS

See Controls, Fire Protection Sprinkler System; Valves, Fire Protection Sprinkler System Control

SPRINKLERS FOR FIRE PROTECTION

See Heads, Sprinkler

STACKS AND CHIMNEYS, INDUSTRIAL, PREFABRICATED

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
American Pipe & Steel Corp., Alhambra, Calif.
Bigelow Co., The, New Haven, Conn.
Chicago Metal Mfg. Co., Chicago, Ill.
Condensation Engineering Corp., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Hodge Boiler Wks., East Boston, Mass.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Kellogg Co., M. W., The, New York, N. Y.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Shutt Process Equipment Corp., St. Louis, Mo.
Smith Corp., A. O., Milwaukee, Wis.
Van-Packer Corp., Bettendorf, Ia.

STAINLESS STEEL PIPE

See Pipe, Steel, Stainless

STAINLESS STEEL SHEETS

See Sheets, Steel, Stainless

STANDS, PIPE VISE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Capewell Mfg. Co., Hartford, Conn.
Erie Tool Wks., Erie, Pa.
International Forge Co., Chicago, Ill.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Martin & Sons, H. P., Owensboro, Ky.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Western Wire Products Co., St. Louis, Mo.
Williams & Co., J. H., Buffalo, N. Y

STANDS, TANK

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
American Pipe & Steel Corp., Alhambra, Calif.
California Steel Products Div., Richmond, Calif.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.

STAPLES FOR FASTENING TUBING

See Hangers and Supports, Pipe

STARTERS, MOTOR

See Controllers and Starters, Motor

STEAM BOOSTER COMPRESSORS

See Compressors, Steam Booster

STEAM ENGINES

See Engines, Steam

STEAM GENERATORS

See Boilers

STEAM JET HEATERS

See Heaters, Steam Jet, for Liquids

STEAM JET REFRIGERATION

See Compressors, Refrigerating, Steam Jet

STEAM PRESSURE REGULATORS

See Valves, Pressure Reducing and Regulating

STEAM PUMPS

See Pumps, Steam

STEAM SEPARATORS

See Separators, Steam and Oil

STEAM TRAPS

See Traps, Steam

STEEL PIPE

See Pipe, Steel

STEEL TUBE FITTINGS, FLARED

See Fittings, Steel Tube, Flared

STEEL TUBING

See Tubing, Steel

STEEL UNIONS

See Unions, Steel

STEEL VALVES

See Valves, Gate; and Valves, Globe

STERILIZING LAMPS

See Lamps, Sterilizing, for Duct Installation

STERILIZING UNITS

See Units, Sterilizing, Air

STOCKS AND DIES

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Crown Die & Tool Corp., Chicago, Ill. (Pipe)
Erie Tool Wks., Erie, Pa.
Greenfield Tap & Die Corp., Greenfield, Mass.
Hollands Mfg. Co., Erie, Pa.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Thor Tool & Die Co., San Leandro, Calif.
Threadwell Tap & Die Co., Greenfield, Mass.
Toledo Pipe Threading Machine Co., Toledo, O.

STOKERS, INDUSTRIAL AND COMMERCIAL

61 *to* 1200 *Lb per Hr*

Allington & Curtis Mfg. Co., Saginaw, Mich. (For shavings, chips and sawdust)
American Coal Burner and Wood Stoker Corp., Chicago, Ill. (solid fuels combination system)
American Engineering Co., Philadelphia, Pa. (underfeed, spreader)
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Heating Div., Auburn, Ind.
Automatic Corp., St. Louis, Mo.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Canton Stoker Corp., Canton, O.
Carnes, Inc., John R., Lima, O.
Carpenter Heating & Stoker Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Dayton Automatic Stoker Co., Dayton, O.
Detroit Stoker Co., Monroe, Mich. (300 lbs coal per hr to 400,000 lb steam per hr)
Electric Furnace-Man, Inc., Emmaus, Pa. (wet grate)
Erie City Iron Works, Erie, Pa.
Flynn & Emrich Co., Baltimore, Md.
Frederick Iron & Steel Inc., Frederick, Md.
Freeman Heating Div., Illinois Iron & Bolt Co., Carpentersville, Ill.
Gross-Aire Mfg. Co., Overland, Mo.
Heating Assurance, Inc., Spokane, Wash.
Hershey Motorstoker, Inc., Manheim, Pa. (anthracite)
Hoffman Combustion Engrg. Co., Lincoln Park, Mich. (spreader type; 10,000 to 500,000 lb. per hr)
Iron Fireman Mfg. Co., Cleveland, O. (underfeed)
Johnston & Jennings Co., Cleveland, O. (chain grate)
Kol-Master Corp., Oregon, Ill.
Laclede Stoker Co., St. Louis, Mo. (chain grate, spreader) (over 1200 lb per hr)
Leffel & Co., James, Springfield, O.
Mallory Sales Co., Dolton, Ill.
Meyer Furnace Co., The, Peoria, Ill.
Muncie Gear Wks., Inc., Muncie, Ind.
Ormsby-Osterman, Inc., St. Louis, Mo.
Riley Stoker Corp., Worcester, Mass.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Stewart-Warner Corp., U.S. Machine Div., Lebanon, Ind.
Sun-Fire Stoker Corp., New Albany, Ind. (Hopper and bin feed)

V. & E. Products, Inc., Schuylkill Haven, Pa.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whiting Fire Power Products Corp., Superior, Wis. (domestic 10-50 lbs. Whiting 10-50)
Whitty Co., Inc., Boston, Mass. (Bituminous)
Will-Burt Co., The, Orrville, O.

STONEWARE PIPE
See Pipe, Stoneware

STORAGE WATER HEATERS
See Heaters, Water, Steam, Storage

STRAINERS, PIPE LINE
A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Air-Maze Corp., Cleveland, O.
Alco Valve Co., St. Louis, Mo.
American District Steam Div., ADSCO Industries Inc., Buffalo, N. Y.
Andale Co., Philadelphia, Pa.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Armstrong Machine Wks., Three Rivers, Mich.
Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., Newtonville, Mass. (steam and water only)
Barrett Haentjens & Co., Hazelton, Pa.
Blackmer Pump Co., Grand Rapids, Mich.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Coen Co., San Francisco, Calif.
Corning Glass Works, Corning, N. Y.
Crane Co., Chicago, Ill.
Cuno Engineering Corp., Meriden, Conn.
Davis Regulator Co., Chicago, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
De Zurik Shower Co., Sartell, Minn.
Eddington Metal Specialty Co., Eddington, Pa.
Edward Valves, Inc., East Chicago, Ind.
Elliott Co., Jeannette, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
General Ceramics Corp., Keasbey, N. J. (ceramic)
General Controls Co., Glendale, Calif. and Skokie, Ill.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Granberg Corp., Oakland, Calif.
Hauck Mfg. Co., Brooklyn, N. Y.
Hays Mfg. Co., Erie, Pa.
Henry Valve Co., Melrose Park, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Kaye & McDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y.
Leslie Co., Lyndhurst, N. J.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Morrison Brothers Co., Dubuque, Ia.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Newark Wire Cloth Co., Newark, N. J.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
OPW Corp., Cincinnati, O.
Perfecting Service Co., Charlotte, N. C.
Phillips & Co., H. A., Chicago, Ill.
Pittsfield Products, Inc., Ann Arbor, Mich. (wire cloth)
Preferred Utilities Mfg. Corp., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Roylyn, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Self Cleaning Strainer Co., Oak Lawn, Ill.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Standard Machine & Mfg. Co., St. Louis, Mo.
Staples & Pfeiffer, San Francisco, Calif.
Sterling, Inc., Milwaukee, Wis.
Strong, Carlisle & Hammond, Cleveland, O.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc. Westfield, Mass.
Walworth Co., New York, N. Y.
Warren Engineering Co., Broadway, N. J.
Water Cooling Corp., New York, N. Y.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Winslow Engineering & Mfg. Co., Oakland, Calif.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.
Zurn Mfg. Div., J. A., Zurn Industries, Inc., Erie, Pa.

STRAINERS, REFRIGERANT, LIQUID LINE
A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
General Controls Co., Glendale, Calif.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Madden Brass Products Co., Aurora, Ill.
McIntire Co., The, Livingston, N. J.
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Penn Controls, Inc., Goshen, Ind.
Pittsfield Products, Inc., Ann Arbor, Mich. (wire cloth)
Refrigerating Specialties Co., Chicago, Ill.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Self Cleaning Strainer Co., Oak Lawn, Ill.
Standard Machine & Mfg. Co., St. Louis, Mo.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Wabash Corp., Chicago, Ill.

STRAINERS, SUCTION, FOR AIR WASHERS
Bahnson Co., Winston-Salem, N. C.
Eddington Metal Specialty Co., Eddington, Pa.
Keckley Co., O. C., Skokie, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Newark Wire Cloth Co., Newark, N. J.
Staples & Pfeiffer, San Francisco, Calif.
Water Cooling Corp., New York, N. Y.

STRESS RELIEVERS
See Preheaters and Stress Relievers, Electric, for Pipe Welds

STRIP HEATERS
See Heaters, Strip and Immersion, Electric

STRUCTURAL SHAPES
See Angles, Bars, Beams, Channels and Tees

STUD DRIVERS
See Fasteners, Powder Operated

STUD WELDERS
See Welders, Stud

SUCTION LINE HEAT EXCHANGERS
See Exchangers, Heat, Refrigerant Suction Line

SUMP PUMPS
See Pumps, Sump

SUPERHEATERS, PROCESS STEAM
Alstrom Corp., New York, N. Y.
Babcock & Wilcox Co., Boiler Div., New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Combustion Engineering, Inc., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Electro-Therm, Inc., Silver Spring, Md.
Foster Wheeler Corp., New York, N. Y.
Murray Iron Wks. Co., Burlington, Ia.
Springfield Boiler Co., Springfield, Ill.
Tranter Mfg. Inc., Lansing, Mich.
Union Iron Works, Erie, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

SURFACE, FINNED, COOLING, BRINE
Aerofin Corp., Syracuse, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Blower Corp., Detroit, Mich.
Brown Fintube Co., The, Elyria, O.
Drayer-Hanson, Div. of National U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
G. & O. Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products, Inc., Minneapolis, Minn.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Detroit, Mich.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, COOLING, COLD WATER
Aerofin Corp., Syracuse, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Bayley Blower Co., Milwaukee, Wis.
Brown Fintube Co., The, Elyria, O.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Halstead & Mitchell, Pittsburgh, Pa.
Hastings Air Control, Inc., Omaha, Nebr.

Heat-Exchangers, Inc., Chicago, Ill.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products, Inc., Minneapolis, Minn.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, LaCrosse, Wis.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United States Air Conditioning Corp.,Philadelphia, Pa.
United Electric Co., Wichita Falls, Tex.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Witt Co., A. H., Los Angeles, Calif.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, COOLING, DIRECT EXPANSION

Aerofin Corp., Syracuse, N. Y.
Alco Products, Inc., Schenectady, N. Y.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Baker Mfg. Co., Wichita Falls, Tex.
Bayley Blower Co., Milwaukee, Wis.
Bohn Aluminum & Brass Corp., Detroit, Mich.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Brown Fintube Co., The, Elyria, O.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Fedders-Quigan Corp., Buffalo, N. Y.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Halstead & Mitchell, Pittsburgh, Pa.
Hastings Air Control, Inc., Omaha, Nebr.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kennard Corp., St. Louis, Mo.
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products, Inc., Minneapolis, Minn.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg. Inc., Lansing, Mich.
Tubenfin Coil Co., Houston, Tex.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United Electric Co., Wichita Falls, Tex.
United States Air Conditioning Corp., Philadelphia, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Witt Co., A. H., Los Angeles, Calif.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, HEATING AND COOLING, PRE-ASSEMBLED, INCLUDING COILS, ELIMINATOR PLATES, SETTLING TANK, AND CASING

Blazer & Son, M., Passaic, N. J.
Clarage Fan Co., Kalamazoo, Mich.
Edwards Engineering Corp., Pompton Plains, N. J.
Marlo Coil Co., St. Louis, Mo.
Modine Mfg. Co., Racine, Wis.
Niagara Blower Co., New York, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.

SURFACE, FINNED, HEATING, INDIRECT, FERROUS

Bayley Blower Co., Milwaukee, Wis.
Brown Fintube Co., The, Elyria, O.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Griscom-Russell Co., The, Massillon, O.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kritzer Radiant Coils, Inc., Chicago, Ill.
McCord Corp., Detroit, Mich.
Modine Mfg. Co., Racine, Wis.
Moore Dry Kiln Co., Jacksonville, Fla.
Murray Mfg. Co., D. J., Wausau, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
New York Blower Co., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rigidbilt Inc., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products Inc., Minneapolis, Minn.
Spi-Rol-Fin Corp., Pequannock, N. J.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

SURFACE, FINNED, HEATING, INDIRECT, NON-FERROUS

Aerofin Corp., Syracuse, N. Y.
American Blower Corp., Detroit, Mich.
Bayley Blower Co., Milwaukee, Wis.
Blazer & Son, M., Passaic, N. J.
Brown Fintube Co., The, Elyria, O.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
Embassy Steel Products, Inc., Brooklyn, N. Y.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Halstead & Mitchell, Pittsburgh, Pa.
Hastings Air Control, Inc., Omaha, Neb.
Heat-Exchangers, Inc., Chicago, Ill.
Heat-X, Inc., Brewster, N. Y.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Industrial Mfg. & Industrial Co., Chicago, Ill.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lewis & Saunders, Lakeport, N. H.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rigidbilt Inc., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products Inc., Minneapolis, Minn.
Spi-Rol-Fin Corp., Pequannock, N. J.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, LaCrosse, Wis.
Tubenfin Coil Co., Houston, Tex.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United States Air Conditioning Corp., Philadelphia, Pa.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Witt Co., A. H., Los Angeles, Calif.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE THERMOSTATS

See Thermostats, Surface

SUSPENDED FURNACES

See Heaters, Air

SWING JOINTS

See Joints, Pipe, Flexible Swing and Revolving

SWITCHES, ELECTRICAL

Adam Electric Co., Frank, St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Automatic Switch Co., Orange, N. J.
Barber-Colman Co., Rockford, Ill.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Burke Engineering, Los Angeles, Calif.
Circuit Protective Devices Dept., General Electric Co., Plainville, Conn.
Clark Controller Co., Cleveland, O.
Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Ebert Electronics Corp., Queens Village, N. Y.
Electric Controller & Mfg. Co., Div. of Square D Co., Cleveland, O.
Essex Wire Corp., Ft. Wayne, Ind.
Ferro Electric Products, Inc., Kirkland, Ill.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., **Construction Materials Div., Bridgeport, Conn.**

Goodwill Mfg. Co., Chicago, Ill.
Guardian Electric Mfg. Co., Chicago, Ill.
Hammett Electric Mfg. Co., Kansas City, Mo.
Hart Mfg. Co., Hartford, Conn.
Haydon Co., A. W., Waterbury, Conn.
Heinemann Electric Co., Trenton, N. J.
Kulka Electric Mfg. Co., Inc., Mt. Vernon, N. Y.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Mallory Co., P. R., Indianapolis, Ind.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
Micro Switch Div. of Minneapolis-Honeywell Regulator Co., Freeport, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Monitor Controller, Rockland, Mass.
Morse-Smith-Morse, Inc., Watertown, Mass.
National Acme Co., The, Cleveland, O.
Parish Co., New Orleans, La.
Penn Controls, Inc., Goshen, Ind.
Pyle-National Co., The, Chicago, Ill.
Reynolds Electric Co., River Grove, Ill.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass. (precision)
Square D Co., Detroit, Mich.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Struthers-Dunn, Inc., Pitman, N. J.
Tork Time Controls, Inc., Mount Vernon, N. Y.
Unimax Switch Div., W. L. Maxson Corp., Wallingford, Conn.
United Electric Controls Co., Watertown, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Co., St. Louis, Mo.
Wind-Way Fan & Ventilator Co., New Orleans, La. (fire fuse)
Zenith Electric Co., Chicago, Ill.

SWITCHES, FLOAT, REFRIGERATION

Alco Valve Co., St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Clark Controller Co., Cleveland, O.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Frick Co., Waynesboro, Pa.
Magnetrol, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.

SWITCHES, FLOW

Cook Electric Co., Chicago, Ill.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Drying Systems, Inc., Chicago, Ill. (air)
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hays Mfg. Co., Erie, Pa.
Magnetrol Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.

SWITCHES, LIQUID LEVEL

Alco Valve Co., St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Automatic Control Co., St. Paul, Minn.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Clark Controller Co., Cleveland, O.
Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cook Electric Co., Chicago, Ill.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Detroit Controls Corp., Detroit, Mich.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Mfg. Co., Erie, Pa.
Healy Ruff Co., St. Paul, Minn.
Kenco Pump Div., American Crucible Products Co., Lorain, O.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Newark Controls Co., Bloomfield, N. J.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Controls, Inc., Goshen, Ind.
Petrometer Corp., Long Island City, N. Y.
Ripley Co., Inc., Middletown, Conn.
Schaub Engineering Co., Fred H., Chicago, Ill.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Techniflex Corp., Port Jervis, N. Y.
Trimount Instrument Co., Chicago, Ill.
United Electric Controls Co., Watertown, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.

SWITCHES, MERCURY

Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Ebert Electronics Corp., Queens Village, N. Y.
G. M. Mfg. Co., New York, N. Y.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Mercoid Corp., Chicago, Ill.
Micro Switch Div. of Minneapolis-Honeywell Reg. Co., Freeport, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Newark Controls Co., Bloomfield, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa.

SWITCHES, PNEUMATIC

Allen-Bradley Co., Milwaukee, Wis.
Automatic Control Co., St. Paul, Minn.
Bristol Co., The, Waterbury, Conn.
Bryant Industrial Products Corp., Cleveland, O.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cook Electric Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.

SWITCHES, PRESSURE AND VACUUM

Allen-Bradley Co., Milwaukee, Wis.
Au-Temp-Co Corp., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Barksdale Valves, Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Bryant Industrial Products Corp., Cleveland, O.
Clark Controller Co., Cleveland, O.
Cleveland Fuel Equipment Co., Cleveland, O.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cook Electric Co., Chicago, Ill.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., Boody, Ill.
Detroit Controls Corp., Detroit, Mich.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Furnas Electric Co., Batavia, Ill.
General Controls Corp., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Healy Ruff Co., St. Paul, Minn.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Leach Relay Co., Los Angeles, Calif.
Longergan Co., J. E., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nason Co., Clarkston, Mich.
Newark Controls Co., Bloomfield, N. J.
Penn Controls, Inc., Goshen, Ind.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Shallcross Controls, Inc., Milwaukee, Wis.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Synchro-Start Products, Inc., Skokie, Ill.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Co., St. Louis, Mo.

SWITCHES, TIME

Aemco Inc., Mankato, Minn.
A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J.
Allen-Bradley Co., Milwaukee, Wis.
April Showers Co., Inc., Washington, D. C.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Burke Engineering, Los Angeles, Calif.
Clock & Timer Dept., General Electric Co., Ashland, Mass.
Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Cramer Controls Corp., Centerbrook, Conn.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
General Controls Corp., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hammett Electric Mfg. Co., Kansas City, Mo.
Hansen Mfg. Co., Princeton, Ind. (timing motors and time machine)
Haydon Co., A. W., Waterbury, Conn.
Haydon Mfg. Co., Inc., Sub. General Time Corp., Torrington, Conn.
Heat-Timer Corp., New York, N. Y.
International Register Co., Chicago, Ill.
Mallory Co., P. R., The, Indianapolis, Ind.
Mercoid Corp., Chicago, Ill.
Miller-Harris Instrument Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
National Time & Signal Corp., Detroit, Mich.
Paragon Electric Co., Two Rivers, Wis.
Reliance Automatic Lighting Co., Racine, Wis.
Rhodes, Inc., M. H., Hartford, Conn.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Sangamo Electric Co., Springfield, Ill.
Tork Time Controls, Inc., Mount Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Co., St. Louis, Mo.
Zenith Electric Co., Chicago, Ill.

SWIVEL PIPE COUPLINGS

See Joints, Pipe, Flexible Swing and Revolving

SYSTEMS, COMBUSTION CONTROL

Ace Instrument Co., Inc., Brooklyn, N. Y.
Askania Regulator Co., Chicago, Ill.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cash Co., A. W., Decatur, Ill.
Cleveland Fuel Equipment Co., Cleveland, O.
Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
De-Tec-Tronic Corp., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Engineer Co., New York, N. Y.
Ess Instrument Co., Bergenfield, N. J.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Roth Co., Roy E., Rock Island, Ill.
Shallcross Controls, Inc., Milwaukee, Wis.
Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Stout & Sons, David, St. Louis, Mo.
Webster Engineering Co., Tulsa, Okla.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

SYSTEMS, CONDENSATE RETURN

Acker Corp., Meridian, Miss.
Advance Pump Co., Berkeley, Calif.
Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.
Barnes & Jones, Inc., Newtonville, Mass.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Dunham-Bush, Inc., West Hartford, Conn.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Corp., The, Three Rivers, Mich.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Patterson-Kelley Co., Inc., The, E. Stroudsburg, Pa.
Sacro Co., Inc., New York, N. Y.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Stout & Sons, David, St. Louis, Mo.
Templeton Bros., Hyde Park, Mass.
Weil Pump Co., Chicago, Ill.
York-Shipley, Inc., York, Pa.

SYSTEMS, ELECTRIC PIPE HEATING

Everwarm, Inc., Knoxville, Tenn.
Fluid Systems, Inc., New Haven, Conn.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Hammett Electric Mfg. Co., Kansas City, Mo.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Trent, Inc., Philadelphia, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

SYSTEMS, FIRE EXTINGUISHING, AND HEAT AND SMOKE DETECTORS

Allen Mfg. Co., W. D., Chicago, Ill.
Blaw Knox Co, Power Piping & Sprinkler Div., Pittsburgh, Pa.
C-O-Two Fire Equipment Co., Newark, N. J.
Cardox Corp., Chicago, Ill.
Edison, Inc., Thomas A., West Orange, N. J.
Grinnell Co., Inc., Providence, R. I.
Heat-Timer Corp., New York, N. Y.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Worner Electronic Devices, Rankin, Ill.

SYSTEMS, HEATING, HIGH TEMPERATURE HOT WATER

Over 350 F

American Hydrotherm Corp., Long Island City, N. Y.
Barber-Colman Co., Rockford, Ill.
Buxton Mfg. Co., Dover, N. J.
Combustion Engineering Inc., New York, N. Y.
International Boiler Works, The, East Stroudsburg, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Ross Engineering Corp., J. O., New York.

SYSTEMS, HEATING, HOT WATER

Barber-Colman Co., Rockford, Ill.
Baseline Mfg. Corp., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Beltran Associates, Inc., Brooklyn, N. Y.
Buxton Mfg. Co., Dover, N. J.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Federal Boiler Co., Inc., Midland Park, N. J.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kaiser Co., E. B., Glenview, Ill.
Kehm Corp., The, Chicago, Ill.
Patterson-Kelley Co., Inc., The, E. Stroudsburg, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Sullivan Valve & Engineering Co., Butte, Mont.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A. Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Weil-McLain Co., Michigan City, Ind.

SYSTEMS, HEATING, VACUUM

Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

SYSTEMS, HEATING, VAPOR

Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter. Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

SYSTEMS, HEATING, ZONE CONTROL

Armstrong Machine Wks., Three Rivers, Mich.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Barnes & Jones, Inc., Newtonville, Mass.
Bell & Gossett Co., Morton Grove, Ill.
Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Dunham-Bush, Inc., West Hartford, Conn.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Weil-McLain Co., Michigan City, Ind.
Zone-Heat Regulator Co., Garrettsville, O.

SYSTEMS, HOT GAS DEFROSTING, FOR REFRIGERATION

Blazer & Son, M., Passaic, N. J.
Dole Refrigerating Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McQuay, Inc., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Tenney Engineering, Inc., Union, N. J.
Vilter Mfg. Co., The, Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.

SYSTEMS, PROCESS HEATING, HIGH TEMPERATURE

American Hydrotherm Corp., Long Island City, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Beltran Associates, Inc., Brooklyn, N. Y.
Buxton Mfg. Co., Dover, N. J.
Dow Chemical Co., The, Midland, Mich.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
International Boiler Works, The, East Stroudsburg, Pa.
Kaiser Co., E. B., Glenview, Ill.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
Olson & Co., Arthur A., Canfield, O.
Parks-Cramer Co., Fitchburg, Mass.
Peabody Engineering Corp., New York, N. Y.
Ross Engineering Corp., J. O., New York, N. Y.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Sarcotherm Controls, Inc., New York, N. Y.
Struthers Wells Corp., Titusville, Pa.
Trent, Inc., Philadelphia, Pa.

SYSTEMS, ROOF SPRAYING (FOR COOLING ROOFS)

April Showers Co, Inc., Washington, D. C.
Binks Mfg. Co., Chicago, Ill.
Muellermist Irrigation Co., Maywood, Ill.
Ruppright's Rotary Roof Cooler, Los Angeles, Calif.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Water Cooling Corp., New York, N. Y.

TABLES, BENDING, PIPE

American Pipe Bending Machine Co., Inc., Poultney, Vt.

TAGS, VALVE, FOR IDENTIFYING VALVES

Burke Engineering Co., Los Angeles, Calif.
Chase Brass & Copper Co., Waterbury, Conn.
Meyer & Wenthe, Inc., Chicago, Ill.
Seton Name Plate Co., New Haven, Conn.

TANK FITTINGS

See Fittings and Bushings, Fuel Oil Tank; Alarms, Liquid Level

TANK HEADS

See Parts, for Heating and Air Conditioning Equipment

TANK LININGS

See Coatings, Protective, for Metals

TANKS, BLOWOFF

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
American Pipe & Steel Corp., Alhambra, Calif.
American Water Softener Co., Philadelphia, Pa.
Bigelow Co., The, New Haven, Conn.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros Boiler & Mfg Co., Wm., Minneapolis, Minn.
Buffalo Tank Corp., Dunellen, N. J.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc., Chicago, Ill.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Gabriel Boiler Co., Portland, Ore.
Graver Water Conditioning Co., New York, N. Y.
Hoppes Mfg. Co., Inc., Springfield, O.
International Boiler Works Co., The, East Stroudsburg, Pa.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lucey Boiler & Mfg. Corp., Chattanooga, Ill.
Manitowoc Shipbuilding, Inc, Manitowoc, Wis.
Morrison Brothers Co., Dubuque, Ia.
Murray Iron Wks. Co., Burlington, Ia.
Nooter Corp., St. Louis, Mo.
Norse Boiler Co., Inc, New Market, N. J.
Novelty Steam Boiler Wks., Inc., Baltimore, Md.
Patterson-Kelley Co., Inc., East Stroudsburg, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Richmond Engineering Co., Richmond, Va.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Union Iron Works, Erie, Pa.

TANKS, EXPANSION, FOR HOT WATER HEATING SYSTEMS

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
Baseline Mfg. Corp., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Biggs Boiler Works Co., E. Akron, O.
Birchfield Boiler, Inc., Tacoma, Wash.
Buffalo Tank Corp., Dunellen, N. J.
Caldwell Co., W. E., Louisville, Ky.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Gabriel Boiler Co., Portland, Ore.
General Automatic Products Corp., Baltimore, Md.
Kehm Corp., The, Chicago, Ill.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Morrison Brothers Co., Dubuque, Ia.
Norse Boiler Co., Inc., New Market, N. J.
Novelty Steam Boiler Wks., Inc., Baltimore, Md.
Patterson-Kelley Co., Inc., East Stroudsburg, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Rheem Mfg. Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Scaife Co., Oakmont, Pa.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Western Blower Co., Seattle, Wash.
Wood Co., John, Conshohocken, Pa.

TANKS, PROCESS AND STORAGE

Acme Welding, Div. of the United Tool & Die Co., West Hartford, Conn.
Alco Products, Inc., Schenectady, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.
American Hard Rubber Co., New York, N. Y. (Rubber lined)
American Pipe & Steel Corp., Alhambra, Calif.
Atlas Mineral Products Co., Mertztown, Pa.
Beaird Co., J. B., Shreveport, La.
Bell & Gossett Co., Morton Grove, Ill.
Bigelow Co., New Haven, Conn.
Biggs Boiler Wks. Co., E. Akron, O.
Birchfield Boiler, Inc., Tacoma, Wash.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Buffalo Tank Corp., Dunellen, N. J.
Caldwell Co., W. E., Louisville, Ky.
Chicago Bridge & Iron Co., Chicago, Ill.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc., Chicago, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Corite Products, Inc., Chicago, Ill. (plastic)
Day Co, The, Minneapolis, Minn.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Dillon Steam Boiler Wks., Inc., D. M., Fitchburg, Mass.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Downingtown, Pa.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Elastic Porcelain Lining Corp., Rochester, N. Y. (Tank linings)
Erie City Iron Wks., Erie, Pa.
Falstrom Co., Passaic, N. J.
Farrar & Trefts Div., ADSCO Industries, Inc., Buffalo, N. Y.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Frick Co., Waynesboro, Pa.
Gabriel Boiler Co., Portland, Ore.
Gehri Co., Tacoma, Wash.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware, plastic, & porcelain)
General Fittings Co., East Greenwich, R. I.
Gerstein & Cooper, Inc., South Boston, Mass.
Goodrich Co., B. F., Akron, O. (Rubber lined)
Haveg Industries, Inc., Newark, Del.
Heil Process Equipment Corp., Cleveland, Ohio
Hodge Boiler Works, East Boston, Mass.
Hoppes Mfg. Co., Inc., Springfield, O.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
International Boiler Wks., The, East Stroudsburg, Pa.
International Engineering, Inc., Dayton, O.
Kaustine Furnace & Tank Corp., Perry, N. Y.
Kellogg Co., M. W., The, New York, N. Y.
Kirk & Blum Mfg. Co., Cincinnati, O.
Knight, Maurice A., Akron, O. (acid-proof, lined steel)
Kopperman & Sons, Joseph, Philadelphia.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Littleford Bros. Inc., Cincinnati, O.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Meldon Industries Div., Tool Industries, Inc., Detroit, Mich.
Mesker Steel Corp., Geo. L., Evansville, Ind.
Morrison Brothers Co., Dubuque, Ia.
Murray Iron Wks. Co., Burlington, Ia.
Newcomb-Detroit Co., Detroit, Mich.
Nooter Corp., St. Louis, Mo.
Norse Boiler Co., Inc., New Market, N. J.
Novelty Steam Boiler Wks., Inc., Baltimore.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (glass)
Portland Copper & Tank Works, Inc., South Portland, Me.
Quaid Fabrications, Inc., Philadelphia, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Richmond Engineering Co., Richmond, Va.
Rosebraugh Co., W. W., Salem, Ore.
Roth Co., Roy E., Rock Island, Ill.
S & C Mfg. Co., Cincinnati, O. (plastics)
Santa Fe Tank & Tower Co., Inc., Los Angeles, Calif.
Santa Fe Tank & Tower Co. of Texas, an Affiliate of Fluor Products Co., Garland, Texas
Scaife Co., Oakmont, Pa.
Sims Co., Erie, Pa.
Struthers Wells Corp., Titusville, Pa.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Tippett & Wood, Phillipsburg, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Van Noorden Co., E., Boston, Mass.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., W. Hartford, Conn.
Wood Co., John, Conshohocken, Pa.
Youngstown Welding & Engineering Co., Youngstown, O.
Zingheim Co., William C., Chicago, Ill.

TAPE, DUCT, ADHESIVE, FOR SEALING JOINTS

Goodrich Industrial Products Co., B. F., Akron, O.
Grant Wilson, Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Miracle Adhesives Corp., Bellmore, N. Y.
Mortell Co., J. W., Kankakee, Ill.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
Permacel Tape, New Brunswick, N. J.
Seamless Rubber Co., The, F. O. S. Industrial Tape Div., New Haven, Conn.

TAPE, INDUSTRIAL, ADHESIVE

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Corbman Bros., Inc., Philadelphia, Pa.
Dayton Rubber Co., Dayton, O.
Dearborn Tape & Label Co., Dearborn, Mich.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Durkee-Atwood Co., Minneapolis, Minn.
Gerrard & Co., A. J., Melrose Park, Ill.
Goodrich Co., B. F., Akron, O.
Johns-Manville, New York, N. Y.
Kendall Co., Polyken Sales Div., Chicago, Ill.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Detroit, Mich.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Norton Co., Worcester, Mass.
Owens-Corning Fiberglas Corp., Toledo, O.
Permacel Tape, New Brunswick, N. J.
Products Research Co., Los Angeles, Calif.
Rubber & Plastics Compound Co., New York, N. Y. (vinyl and polyethylene)
Seamless Rubber Co., The, F.O.S. Industrial Tape Div., New Haven, Conn.
Spring Packing Corp., Chicago, Ill.
United Mineral & Chemical Corp., New York, N. Y.
United States Rubber Co., New York, N. Y.

TAPS, PIPE

Greenfield Tap & Die Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Threadwell Tap & Die Co., Greenfield, Mass.

TELEVISION, INDUSTRIAL, CLOSED-CIRCUIT

Diamond Power Specialty Corp., Lancaster, O.
Radio Corp. of America, Engineering Products Dept., Camden, N. J.

TEMPERATURE AND HUMIDITY CONTROLS

See Humidistats; Recorder-Controllers; Thermostats

TEMPERATURE RECORDERS

See Recorders, Temperature

TEMPERATURE REGULATORS

See Regulators, Temperature

TEMPLATES, DRAWING, PIPING

Alco Products, Inc., Schenectady, N. Y.
Dietzgen Co., Eugene, Chicago, Ill.
Graphic Indicator Co., Los Angeles, Calif.

TEST CHAMBERS

See Chambers, Test, Controlled Temperature and Humidity

TESTERS, DUST SPOT, FOR AIR FILTERS

Research Appliance Co., Allison Park, Pa.
Trerice Co., H. O., Detroit, Mich.

TESTERS, FUEL UNIT

Kingsley Mfg. Co., New Haven, Conn.

TESTERS, GAGE, DEAD WEIGHT

American Instrument Co., Inc., Silver Spring, Md.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Cleveland, O.
Trerice Co., H. O., Detroit, Mich.

TESTERS, LEAK, FOR PIPING AND VESSELS

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Gas & Chemical, Inc., Leak-Tec Div., New York.
American Pipe & Steel Corp., Alhambra, Calif.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Elvee Co., Melrose, Mass.
Greer Hydraulics, Inc., Jamaica, N. Y.
Johnson-Williams, Inc., Palo Alto, Calif.
Mechanical Products Corp., Chicago, Ill.
Universal Controls Corp., Dallas, Tex.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

TESTERS, MOISTURE

Brabender Corp., Rochelle Park, N. J. (semiautomatic)
Kaiser Co., E. B., Glenview, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

TESTERS, SMOKE

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
De-Tec-Tronic Corp., Chicago, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
McNeill Smoke Eliminator Co., Chicago, Ill.
Pyrene CO TWO, Newark, N. J.
Research Appliance Co., Allison Park, Pa.

TESTERS, SOUND, FOR LOCATING MECHANICAL TROUBLES

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Marsh Instrument Co., Skokie, Ill.

THAWERS, PIPE, ELECTRIC, PORTABLE

Fern, Ralph, Scranton, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hammett Electric Mfg. Co., Kansas City, Mo.
Harold Electric Co., Walla Walla, Wash.
Hobart Bros. Co., Troy, O.
Trindl Products, Ltd., Chicago, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOMETER WELLS

See Wells, Thermometer

THERMOMETERS, INDICATING, INDUSTRIAL

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Dillon & Co., Inc., W. C., Van Nuys, Calif.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Moeller Instrument Co., Richmond Hill, N. Y.
New York Air Valve Corp., Brooklyn, N. Y.
Pacific Transducer Corp., Los Angeles, Calif. (for surface temperatures)
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Co., Skokie, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Royco Instruments, Albany, Calif.
Sarco Co., Inc., New York, N. Y.
Schaevitz Engineering, Camden, N. J.
Scientific Instrument Co., Detroit, Mich.
Simpson Electric Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of America Machine and Metals, Inc., Sellersville, Pa.
Victory Engineering Corp., Union, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

THERMOMETERS, INDICATING, PIPE SURFACE TEMPERATURE

Bristol Co., The, Waterbury, Conn.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Moeller Instrument Co., Richmond Hill, N. Y.
Pacific Transducer Corp., Los Angeles, Calif.
Royco Instruments, Albany, Calif.
Simpson Electric Co., Chicago, Ill.
Trerice Co., H. O., Detroit, Mich.
Victory Engineering Corp., Union, N. J.

THERMOMETERS, INDICATING, REMOTE-READING

Airguide Instrument Co., Chicago, Ill.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Century Instrument Co., Detroit, Mich.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc, Chicago, Ill.
Giannini & Co., Inc., G. M., Pasadena, Calif.
H-B Instrument Co., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Industrial Development Laboratories, Inc., Jersey City, N. J.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Moore Products Co., Philadelphia, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Philadelphia Thermometer Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Royco Instruments, Albany, Calif.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Simpson Electric Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Thompson Research & Mfg. Co., Davenport, Fla.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Victory Engineering Corp., Union, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

THERMOMETERS, INDICATING, WALL

Airguide Instrument Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., Boody, Ill.
Dickson Co., The, Chicago, Ill.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia, Pa.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Simpson Electric Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Victory Engineering Corp., Union, N. J.
Weksler Thermometer Corp., Freeport, N. Y. (Effective temperature indicator)
West Instrument Corp., Chicago, Ill.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

THERMOMETERS, KATA

Hill & Co., E. Vernon, Lake Geneva, Wis.

THERMOSTATIC BELLOWS

See Bellows, Thermostatic and Metallic

THERMOSTATIC BI-METALS

See Bi-Metals, Thermostatic

THERMOSTATIC TRAPS

See Traps, Steam, Thermostatic

THERMOSTATS, DUCT TYPE

American District Telegraph Co., New York.
Automatic Devices Co., Inc., Western Springs, Ill.
Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fenwal Inc., Ashland, Mass.
General Controls Co., Glendale, Calif.
Johnson Service Co., Milwaukee, Wis.
Leslie Co., Lyndhurst, N. J.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Moeller Instrument Co., Richmond Hill, N. Y.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Stevens Mfg. Co., Inc., Mansfield, O.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Wesix Electric Heater Co., San Francisco.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, EFFECTIVE TEMPERATURE

Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Sarcotherm Controls, Inc., New York, N. Y.

THERMOSTATS, IMMERSION

Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Detroit Controls Corp., Detroit, Mich.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fenwal Inc., Ashland, Mass.
General Controls Co., Glendale, Calif. and Skokie, Ill.
H-B Instrument Co., Philadelphia, Pa.
Hart Mfg. Co., Hartford, Conn.
Johnson Service Co., Milwaukee, Wis.
Leslie Co., Lyndhurst, N. J.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Philadelphia Thermometer Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wilcolator Co., Elizabeth, N. J.

THERMOSTATS, RADIANT HEAT

Automatic Devices Co., Inc., Western Springs, Ill.
Ceilheat, Inc., Knoxville, Tenn.
Crystalheat Co., Van Nuys, Calif.
Detroit Controls Corp., Detroit, Mich.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Everwarm, Inc., Knoxville, Tenn.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Sunwarm, Inc., Kingsport, Tenn.
Thrush & Co., H. A., Peru, Ind.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, ROOM OR WALL

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Crown Controls Co., Inc., New Bremen, O.
Crystalheat Co., Van Nuys, Calif.
Detroit Controls Corp., Detroit, Mich.
Everwarm, Inc., Knoxville, Tenn.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
McCorkle Co., D. H., Berkeley, Calif.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., The, Chicago, Ill.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Roberson Co., L. N., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wesix Electric Heater Co., San Francisco.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, TWO STAGE, FOR COOLING

Barber-Colman Co., Rockford, Ill.
Penn Controls, Inc., Goshen, Ind.

THERMOSTATS, TWO STAGE, FOR HEATING

Barber-Colman Co., Rockford, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, SURFACE

Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Detroit Controls Corp., Detroit, Mich.
Fenwal Inc., Ashland, Mass.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hart Mfg. Co., Hartford, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
McCorkle Co., D. H., Berkeley, Calif.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Red Spot Electric Co., Tacoma, Wash.
Roberson Co., L. N., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Stevens Mfg. Co., Inc., Mansfield, O.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wilcolator Co., Elizabeth, N. J.

THERMOSTATS, TWO TEMPERATURE OR DUAL

Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Burling Instrument Co., Air Conditioning Div., Chatham, N. J.
Detroit Controls Corp., Detroit, Mich.
Fenwal Inc., Ashland, Mass.
Franklin Dales Co., Akron, O.
General Controls Co., Glendale, Calif. and Skokie, Ill.
H-B Instrument Co., Philadelphia, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Roberson Co., L. N., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
White-Rodgers Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, WEATHER COMPENSATING

Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Crown Controls Co., Inc., New Bremen, O.
Detroit Controls Corp., Detroit, Mich.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Heat-Timer Corp., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
United Electric Controls Co., Watertown, Mass.
White-Rodgers Co., St. Louis, Mo. (Level-Temp)

TIME RECORDER-TOTALIZERS

See Recorder-Totalizers, Time

TIME SWITCHES

See Switches, Time

TOGGLE BOLTS

See Bolts, Toggle and Anchor

TONGS, PIPE

Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Williams & Co., J. H., Buffalo, N. Y.

TOOLS (CHISELS, PLIERS, SCREW DRIVERS, ETC.)

Adre Co., The, Hales Corners, Wis. (burnishers for electrical contacts)
Ampco Metal, Inc., Milwaukee, Wis.
Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind. (hack saws, files)
Badger Sales Co., Inc., Los Angeles, Calif. (magnifying inspectoscope for inspection of hard-to-get-at places)
Basford Co., H. R., San Francisco, Calif. (pliers)

Birks Mfg. Co., Meriden, Conn. (Pittsburgh lock seam opener)
Bonney Forge & Tool Works, Allentown, Pa.
Boston Machine Works Co., Lynn, Mass. (nozzle extractor)
Brown-Brockmeyer Co., Inc., Dayton, O. (tool grinders)
Caliputer, Rancho Sante Fe, Calif. (Caliper-scale)
Cam-loc Div., Empire Products, Inc., Cincinnati, O. (electrode holders)
Carlson Rules Branch, Henry Disston Div., H. K. Porter Co., Inc., Monrovia, Calif. (steel tape rule for reading diameter)
Collins Machinery Corp., Los Angeles, Calif.
Crescent Tool Co., Jamestown, N. Y.
Demo-Haines Tool Corp., Machine Works, Enid, Okla. (portable rotary hammer & drills)
Dreier Brothers, Inc., Chicago, Ill. (level for determining pitch of pipe; hack saws)
Duro-Dyne Corp., New Hyde Park, L. I., N. Y. (file handles and solder iron handles, punches)
Duro Metal Products Co., Chicago, Ill.
Engesser & Co., William L., El Monte, Calif. (bull bits, angle drill attachment)
Erie Tool Wks., Erie, Pa. (Vises, cutter wheels, rollers)
Franklin Balmar Corp., Baltimore, Md. (disc grinders)
Gel-Me Co., Bloomington, Ill. (electric sound probe for locating mechanical trouble)
Gibson Industries, Inc., Muskegon, Mich. (for closing Pittsburgh lock)
Greene, Tweed & Co., North Wales, Pa.
Greenlee Tool Co., Div. of Greenless Bros. & Co., Rockford, Ill.
Hexdall Co., A. M., Morris, Ill. (Pittsburgh lock hammers, tee hammers, seam openers)
Hilti Rapid Fastening Systems, Inc., New York, N. Y. (hammer actuated drive tools)
Howes-Wood Co., Cambridge, Mass. (hacksaws, blades, handsaws)
Hydraulic Mfg. Co., Bridgeport, Conn. (hydraulic water ram)
Hydrozion Engineering Co., Inc., Kansas City, Mo. (earth boring auger)
Independent Blade Corp., Joliet, Ill. (plastic cutting & other saw blades)
Instrument Cases, Inc., Glendale, Calif. (instrument cases)
Jaco Devices Co., Hingham, Mass. (drill attachment for sawing, etc.)
Key-Hak Div., Producers & Distributors, Inc., Allentown, Pa. (hack saw blades for portable power hack saw)
Lenco, Inc., Jackson, Mo. (electrode holders)
Lenk Mfg. Co., Boston, Mass. (electric soldering irons)
Levow, David, New York, N. Y. (3 way clamp)
Lufkin Rule Co., Saginaw, Mich. (steel tapes and folding rules)
Matrix Engineering Corp., Minneapolis, Minn. (pneumatically operated nail driver for concrete, wood, sheet metal)
Millers Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis. (electric screw drivers and hack saws)
Misener Mfg. Co., Inc., Syracuse, N. Y. (hole saws)
Nielsen, Inc., E. V., Stamford, Conn.
Nupla Mfg. Co., Los Angeles, Calif. (hammers of all types)
Omega Products, Chicago, Ill. (pocket size voltage tester)
Owens Co., H., Culver City, Calif. (pattern developer tool for sheet metal work)
Phillips Drill Co., Michigan City, Ind. (impact hammers)
Pickett & Eckel, Inc., Alhambra, Calif. (slide rule)
Pioneer Tool Co., Racine, Wis. (scratch awls, crimping pliers, saw handles)
Proto Tools, Los Angeles, Calif.
R C S Tool Corp., Bloomington, Ill. (reciprocating saw attachment; right angle drill attachments)
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Cleveland, O. (Powder-actuated tools, hammer)
Rawlplug Co., Inc., The, New Rochelle, N. Y. (drills for masonry)
Refrigeration Devices Co., Nutley, N. J. (oiler for refrigeration compressors)
Reiner & Campbell Co., Inc., Newark, N. J. (Dividers, drive cleat notchers)
Remington Arms Co., Inc., Bridgeport, Conn. (powder-actuated tools)
Richmont, Inc., Monrovia, Calif.
Rotary Concrete Drill Co., Pasadena, Calif. (Drill bits)
Rotor Tool Co., Cleveland, O.
Salsbury Corp., Los Angeles, Calif. (air hammer)
Scharf Mfg. Co., J. H., Omaha, Nebr. (magnesium levels)
Schild Mfg. Co., Milwaukee, Wis.
Skinner Co., M. B., South Bend, Ind. (pipe drilling adapter)
Snap-on Tools Corp., Kenosha, Wis.
Stanley Works, The, New Britain, Conn.
Superior Valve & Fittings Co., Pittsburgh, Pa. (wrenches, valving, hand)
Thompson & Son Co., The Henry G., New Haven, Conn.
Wassco Electric Products Corp., Joliet, Ill. (soldering pliers for copper tubing)
Williams & Co., J. H., Buffalo, N. Y.
Wodack Electric Tool Corp., Chicago, Ill. (hammers, electric; groovers, plaster)
Yeats Appliance Dolly Sales Co., Milwaukee, Wis. (dolly for moving equipment upstairs)

TOOLS, FLARING, FOR TUBING

Armstrong Bros. Tool Co., Chicago, Ill.
Bonney Forge & Tool Works, Allentown, Pa.
Capewell Mfg. Co., Hartford, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Pneumatic Tool Co., New York, N. Y.
Chicago Specialty Mfg. Co., Chicago, Ill.
Duro Metal Products Co., Chicago, Ill.
Engesser & Co., William L., El Monte, Calif.
Imperial Brass Mfg. Co., Chicago, Ill.
Kent-Moore Organization, Inc., Warren, Mich.
Madden Brass Products Co., Aurora, Ill.
Mueller Co., Decatur, Ill.
Nye Tool Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Penn Brass & Copper Co., Erie, Pa.
Research Vacuum Supply Co., Chicago, Ill. (Press gears)
Sac Tool Mfg. Co., St. Louis, Mo.
Schaul Mfg. Co., Cleveland, Ohio
Snap-On Tools Corp., Kenosha, Wis.
Span Brass Mfg. Co., Otsego, Mich.
Talon Tools, Inc., North Arlington, N. J.
Williams & Co., J. H., Buffalo, N. Y.
Wilson Co., K. R., Arcade, N. Y.
Wilson, Inc., Thomas C., Long Island City, N. Y.
Wilson Manufacturing Co., Memphis, Tenn.

TORCHES, BRAZING SOLDERING AND WELDING

Aeroil Products Co., Inc., South Hackensack, N. J.
Aeroprojects, Inc., West Chester, Pa.
Air Reduction Co., Inc., New York, N. Y.
Atlas Welding Accessories, Inc., Ferndale, Mich.
Bernz Co., Otto, Rochester, N. Y.
Borm Mfg. Co., Elgin, Ill.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Deutsch Co., The, Los Angeles, Calif.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ergolyte Mfg. Co., Philadelphia, Pa.
Eutectic Welding Alloys Corp., Flushing, N. Y.
Goss Gas, Inc., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
Ideal Industries, Inc., Sycamore, Ill.
Insto-Gas Corp., Detroit, Mich.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
K-G Equipment Co., Allentown, Pa.
Lee Co., K. O., Aberdeen, S. D.
Lenk Mfg. Co., Boston, Mass.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Liquid Carbonic Corp., The, Chicago, Ill.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Mid-States Welder Mfg. Co., Chicago, Ill.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Modern Engineering Co., St. Louis, Mo.
Mutual Liquid Gas & Equipment Co., Gardena, Calif.
National Cylinder Gas Co., Chicago, Ill.
Prepo Corp., Edgerton, Wis.
Ransome Co., Emeryville, Calif.
Reiner & Campbell Co., Inc., Newark, N. J.
Research Vacuum Supply Co., Chicago, Ill.
Sac Tool Mfg. Co., St. Louis, Mo.
Seelye Craftsman, Minneapolis, Minn. (for welding plastics)
Selas Corp of America, Dresher, Pa.
Sight Feed Generator Co., West Alexandria, O.
Smith Welding Equipment Corp., **Minneapolis,** Minn.
Torit Mfg. Co., St. Paul, Minn.
Trindl Products, Ltd., Chicago, Ill.
Turner Brass Works, The, Sycamore, Ill.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich. (for L-P gas, also oxy-acetylene)
Will-Weld Mfg. Co., Inc., Omaha, Neb.

TORQUE INDICATING WRENCHES

See Wrenches, Torque Indicating

TOWERS, COOLING, ATMOSPHERIC

American Cooling Tower Co., Kansas City, Mo.
Binks Mfg. Co., Chicago, Ill.
Dover Mfg. Co., Independence, Mo.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Air Conditioning & Refrigeration Cooling Tower Div., Whittier, Calif.
Harry Cooling Towers, Inc., New York, N. Y.
Koch Engineering Co., Inc., Wichita, Kans.
Lilie-Hoffmann Cooling Towers, Inc., St. Louis, Mo.
Marley Co., The, Kansas City, Mo.
Peerless Products Div., United Cooling Towers, Inc., N. Little Rock, Ark.
Phillips Cooling Tower Co., Inc., Brooklyn.
Pritchard & Co. of California, J. F., Kansas **City, Mo.**
Santa Fe Tank & Tower Co., Inc., Los Angeles, Calif.
Santa Fe Tank & Tower Co. of Texas, an Affiliate of Fluor Products Co., Garland, Tex.
Stewart Ice Machine Co., Pomona, Calif.
Sun-Fire Stoker Corp., New Albany, Ind.
Thermal Agency, Houston, Tex.
TOT Towers, Inc., Houston, Tex.
Toungate & Coats, Austin, Tex.
United Cooling Tower Co., Kansas City, Mo.
United States Air Conditioning Corp., Philadelphia, Pa.
United States Cooling Tower Co., Div. of Heatcraft Co., Louisville, Ky.
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.
Watkins Co., J. E., Maywood, Ill.

TOWERS, COOLING, MECHANICAL DRAFT

Aeme Industries, Inc., Jackson, Mich.
Air Purification Service, Inc., New York, N. Y.
Air & Refrigeration Corp., New York, N. Y.
Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
American Coils Co., Newark, N. J.
American Cooling Tower Co., Kansas City, Mo.
Ayres, Inc., Houston, Tex.
Baldwin Ward Mfg. Co., Inc., Ottawa, Ks.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Binks Mfg. Co., Chicago, Ill.
Blazer & Son, M., Passaic, N. J.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis.
Deansteel Products Co., San Antonio, Tex.
Dover Mfg. Co., Independence, Mo.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Air Conditioning & Refrigeration Cooling Tower Div., Whittier, Calif.
Foster Wheeler Corp., New York, N. Y.
Goodfellow Co., Inc., E. D., Memphis, Tenn.
Governair Corp., Oklahoma City, Okla.
Halstead & Mitchell, Pittsburgh, Pa.
Harry Cooling Towers, Inc., New York, N. Y.
Havens Structural Steel Co., Cooling Tower Div., Kansas City, Mo.
Kennard Corp., St. Louis, Mo.
Knobco Inc., Newport, Ky.
Koch Engineering Co., Inc., Wichita, Kans.

Kramer Trenton Co., Trenton, N. J.
Krueger Air Conditioning Co., Tucson, Ariz.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Larkin Coils, Inc., Atlanta, Ga.
Lilie-Hoffmann Cooling Towers, Inc., St. Louis, Mo.
Marley Co., The, Kansas City, Mo.
Marlo Coil Co., St. Louis, Mo.
Master-Bilt Refrigeration Mfg. Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Morris Sheet Metal Works, Columbus, O.
Niagara Products Co., Phoenix, Ariz.
Peerless Products Div., United Cooling Towers, Inc., N. Little Rock, Ark.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
S & C Mfg. Co., Cincinnati, O.
Santa Fe Tank & Tower Co., Inc., Los Angeles, Calif.
Santa Fe Tank & Tower Co. of Texas, an Affiliate of Flour Products Co., Garland, Tex.
Schancke, Inc., Evansville, Ind.
Servel, Inc., Evansville, Ind.
Silco Products, Inc., Minneapolis, Minn.
Silvercraft, Inc., Louisville, Ky.
Sun-Fire Stoker Corp., New Albany, Ind.
Tenney Engineering Inc.,Union, N. J.
TOT Towers, Inc., Houston, Tex.
Toungate & Coats, Austin, Tex.
United Cooling Tower Co., Kansas City, Mo.
United States Cooling Tower Co., Div. of Heatcraft Co., Louisville, Ky.
United States Air Conditioning Corp., Philadelphia, Pa.
Vogt Machine Co., Henry, Louisville, Ky. (packaged unit with condenser, pump, etc.)
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.

TOWERS, COOLING, NOISE ELIMINATION FOR

See Noise Elimination for Cooling Towers

TRANSFORMERS, ELECTRIC

Acme Electric Corp., Cuba, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Arjac Products Inc., Rochester, N. Y.
Central Transformer Corp., Pine Bluff, Ark.
Crown Controls Co., Inc., New Bremen, O.
Dormeyer Industries, Chicago, Ill.
Eisler Engineering Co., Inc., Newark, N. J.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif., and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hammett Electric Mfg. Co., Kansas City, Mo.
Jefferson Electric Co., Bellwood, Ill.
Line Material Co., Div. of McGraw Electric Co., Milwaukee, Wis.
Rex Welder Co., Kansas City, Mo.
Schaevitz Engineering, Camden, N. J.
Sola Electric Co., Chicago, Ill. (voltage regulating)
Taylor-Winfield Corp., Warren, O.
Thermador Electrical Mfg., Los Angeles, Calif.
Trindl Products, Ltd., Chicago, Ill.
Union Electric & Mfg. Co., Jersey City, N. J. (ignition)
Wagner Electric Corp., St. Louis, Mo.
Webster Electric Co., Racine, Wis.
Westinghouse Electric Corp., Pittsburgh, Pa.

TRANSMISSION DRIVES

See Drives, Chain, Flat Belt and V-Belt

TRANSMITTERS, PRESSURE AND TEMPERATURE

Bristol Co., The, Waterbury, Conn.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.

TRAPS, MAGNETIC, FOR REMOVING TRAMP IRON FROM PIPE LINES

Columbia Engineering Service Co., Santa Rosa, Calif.
Dings Magnetic Separator Co., Milwaukee.
Ladish Co., Tri-Clover Div., Kenosha, Wis.

TRAPS, STEAM, FLOAT-THERMOSTATIC

Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.
Cochrane Corp., Philadelphia, Pa.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Davis Regulator Co., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Haines Div., Wm. S., Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Owens & Co., Inc., Henry, Cranston, R. I.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trerice Co., H. O., Detroit, Mich.
Vis-A-Plug, Inc., King of Prussia, Pa.
Webster & Co., Warren, Camden, N. J.

TRAPS, STEAM, MECHANICAL

Acker Corp., Meridian, Miss.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Armstrong Machine Wks., Three Rivers, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Burrows Mfg. Co., F. A., York, Pa.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Coe Mfg. Co., Painesville, O.
Crane Co., Chicago, Ill.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Fisher Governor Co., Marshalltown, Ia.
Haines Div., William S., Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Corp., The, Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Leavitt Machine Co., Orange, Mass.
Marsh Heating Equipment Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
McAuley Trap Co., Pittsburgh, Pa.
Monash-Younker Co., Inc., Chicago, Ill.
Morehead Mfg. Co., Detroit, Mich.
Nason Co., Clarkston, Mich.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Perfecting Service Co., Charlotte, N. C.
Sarco Co., Inc., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago, Ill.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond, Cleveland, O.
Templeton Bros., Hyde Park, Mass.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Vis-A-Plug, Inc., King of Prussia, Pa. (bucket only)
Watson & McDaniel Co., Philadelphia, Pa.
Webster & Co., Warren, Camden, N. J.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.

TRAPS, STEAM, THERMOSTATIC

Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
Haines Div., William S., Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Strong,Carlisle & Hammond, Cleveland, O.
Templeton Bros., Hyde Park, Mass.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Webster & Co., Warren, Camden, N. J.

TREATMENT, CHEMICAL, TO REMOVE SCALE

Anderson Chemical Co., Inc., Macon, Ga.
Berna Corp., Garwood, N. J.
Calgon, Inc., Pittsburgh, Pa.
Dearborn Chemical Co., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Salsbury Corp., Los Angeles, Calif.

TREATMENT, FUEL OIL, TO PREVENT SLUDGE

Allen Co., Robert G., Mechanicsville, N. Y.
Airose Chemical Co., Providence, R. I.
American Sand-Banum Co., Inc., Freeport, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Eds-Wil Burner Corp., Chicago, Ill.
Elraco Engineering Co., Los Angeles, Calif.
Hercules Chemical Co., Inc., New York, N. Y.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Monsanto Chemical Co., St. Louis, Mo.
Montgomery Chemical Co., Jenkintown, Pa.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Nutmeg Chemical Co., New Haven, Conn.
Perolin Co., Inc., New York, N. Y.
Petroleum Solvents Corp., New York, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Sudbury Laboratory, South Sudbury, Mass.
Warren Refining & Chemical Co., The, Cleveland, O.
Winslow Engineering & Mfg. Co., Oakland, Calif.

TREATMENT, STEAM SYSTEM, TO INHIBIT CORROSION

Allis-Chalmers Mfg. Co., Milwaukee, Wis.

American K. A. T. Corp., Garwood, N. J.
American Water Softener Co., Philadelphia, Pa.
American Well Wks., Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Berna Corp., Garwood, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown-Electro Co., Oklahoma City, Okla.
Calgon, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Chemical Solvent Co., Birmingham, Ala.
Cochrane Corp., Philadelphia, Pa.
Continental Products Co., Euclid, O.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Elgin Softener Corp., Elgin, Ill.
Elraco Engineering Co., Los Angeles, Calif.
Graver Water Conditioning Co., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hall Laboratories, Inc., Pittsburgh, Pa.
Heller Laboratories, Inc., Leonia, N. J.
Hercules Chemical Co., Inc., New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Packard Mfg. Co., Jacksonville, Fla.
Perolin Co., Inc., New York, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc. Providence, R. I.
Rid-Sludge Div., Aulwood Mfg. Co., St. Paul, Minn. (vapor treatment to remove sludge from heating system)
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Strong, Carlisle & Hammond, Cleveland, O.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Warren Refining & Chemical Co., Cleveland, O.
Water Treatment Co. of America, Pittsburgh, Pa.

TREATMENT, WATER, TO INHIBIT CORROSION

Agava Products, Inc., Jersey City, N. J.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Cyanamid & Chemical Corp., New York, N. Y.
American Sand-Banum Co., Inc., Freeport, N. Y.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Berna Corp., Garwood, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown Electro Co., Oklahoma City, Okla.
Calgon, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Cepi-American, Inc., Oak Park, Ill.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Cochrane Corp., Philadelphia, Pa.
Culligan, Inc., Northbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Debevoise Co., The, Brooklyn, N. Y.
Drew & Co., Inc., E. F., New York, N. Y.
Electro Mfg. Co., Houston, Tex.
Electro Rust-Proofing Corp., Belleville, N. J.
Elgin Softener Corp., Elgin, Ill.
Elraco Engineering Co., Los Angeles, Calif.
Fischer & Porter Co., Hatboro, Pa.
Garman Co., Inc., The, St. Louis, Mo.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hall Laboratories, Inc., Pittsburgh, Pa.
Heller Laboratories, Inc., Leonia, N. J.
Hungerford & Terry, Inc., Clayton, N. J.
Industrial Filter & Pump Co., Chicago, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Layne & Bowler, Inc., Memphis, Tenn.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
McMillan Industrial Supplies, C. C., Portland, Ore.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Monsanto Chemical Co., St. Louis, Mo.
Moreheat Distribution, Inc., Cincinnati, O.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I.
Oshkosh Filter & Softener Co., Oshkosh, Wis.
Packard Mfg. Co., Jacksonville, Fla.
Permutit Co., New York, N. Y.
Perolin Co., Inc., New York, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Reynolds Shaffer Co., Detroit, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Salsbury Corp., Los Angeles, Calif.
Saverite Engineering Co., Hoboken, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Strong, Carlisle & Hammond, Cleveland, O.
Sudbury Laboratory, South Sudbury, Mass.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Uniflow Mfg. Co., Erie, Pa.
Virginia Smelting Co., West Norfolk, Va.
Wallace & Tiernan, Inc., Belleville, N. J.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Company of America, Pittsburgh, Pa.
X Laboratories, Inc., New York, N. Y.

TREATMENT, WATER, TO PREVENT SCALE FORMATION

Agava Products, Inc., Jersey City, N. J.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Sand-Banum Co., Inc., Freeport, N. Y.
American Water Softener Co., Philadelphia.
Anderson Chemical Co., Inc., Macon, Ga.
Aqua Electric Scale Control, Inc., Cleveland, O.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown-Electro Co., Oklahoma City, Okla.
Calgon, Inc., Pittsburgh, Pa.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York.
Cepi-American, Inc., Oak Park, Ill.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Cochrane Corp., Philadelphia, Pa.
Culligan, Inc., Northbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Elraco Engineering Co., Los Angeles, Calif.
Garman Co., Inc., The, St. Louis, Mo.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Hall Laboratories, Inc., Pittsburgh, Pa.
Heller Laboratories, Inc., Leonia, N. J.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Madden Corp., Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
McMillan Industrial Supplies, C. C., Portland, Ore.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Olin Mathieson Chemical Corp., Industrial Chemicals Div., Baltimore, Md.
Oshkosh Filter & Softener Co., Oshkosh, Wis.
Pacific Lumber Co., The, San Francisco, Calif.
Permutit Co., New York, N. Y.
Perolin Co., Inc., The, New York, N. Y.
Reynolds Shaffer Co., Detroit, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Smith Chemical Co., E. W., La Puente, Calif.
Strong, Carlisle & Hammond, Cleveland, O.
Uniflow Mfg. Co., Erie, Pa.
Virginia Smelting Co., West Norfolk, Va.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Co. of America, Pittsburgh, Pa.
Winslow Engineering & Mfg. Co., Oakland, Calif.
X Laboratories, Inc., New York, N. Y.

TREATMENT, WATER, FOR SLIME AND ALGAE CONTROL

Agava Products Inc., Jersey City, N. J.
Alrose Chemical Co., Providence, R. I.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Berna Corp., Garwood, N. J.
Bird-Archer Co., Philadelphia, Pa.
Builders Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Calgon, Inc., Pittsburgh, Pa.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Carolina Aniline & Extract Co., Charlotte, N. C.
Chemical Solvent Co., Birmingham, Ala.
Dearborn Chemical Co., Chicago, Ill.
Dow Chemical Co., The, Midland, Mich.
Drew & Co., Inc., E. F., New York, N. Y.
Elraco Engineering Co., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Waldwick, N. J.
Fischer & Porter Co., Hatboro, Pa.
Garman Co., Inc., The, St. Louis, Mo.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hall Laboratories, Inc., Pittsburgh, Pa.
Hanovia Chemical & Mfg. Co., Newark, N. J. (ultraviolet)
Heller Laboratories, Inc., Leonia, N. J.
Hungerford & Terry, Inc., Clayton, N. J.
Layne & Bowler, Inc., Memphis, Tenn.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metal & Thermit Corp., Rahway, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Monsanto Chemical Co., St. Louis, Mo.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Norwood Associated Engineers, Inc., Springfield, Mass.
Oakite Products, Inc., New York, N. Y.
Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I.
Permutit Co., New York, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Perolin Co., Inc., New York, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Smith Chemical Co., E. W., La Puente, Calif.
Solvay Process Div., Allied Chemical & Dye Corp., New York, N. Y.
Steelcote Mfg. Co., St. Louis, Mo.
Strong, Carlisle & Hammond, Cleveland, O.
Virginia Smelting Co., West Norfolk, Va.
Wallace & Tiernan, Inc., Belleville, N. J.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Co. of America, Pittsburgh, Pa.

TRENCHING MACHINES FOR PIPE LINES

See Machines, Trenching for Pipe Lines

TRUCKS, LIFT

American Pulley Co., The, Philadelphia, Pa.
Buda Div., The, Allis-Chalmers Mfg. Co., Harvey, Ill.

TRY-COCKS, BOILER

Crane Co., Chicago, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Diamond Power Specialty Corp., Lancaster, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ernst Water Column & Gauge Co., Livingston, N. J.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Skokie, Ill.
New York Air Valve Corp., Brooklyn, N. Y.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Swift Lubricator Co., Inc., Elmira, N. Y.

TUBE CLEANERS

See Cleaners, Tube

TUBE FINNING MACHINES

See Machines, Tube Finning

TUBES, BOILER

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
H & H Tube & Mfg. Co., Detroit, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis. (stainless)
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.

TUBES, CONDENSER

American Brass Co., Waterbury, Conn.
Ampco Metal, Inc., Milwaukee, Wis.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Bundy Tubing Co., Detroit, Mich.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Chase Brass & Copper Co., Waterbury, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Edwards Engineering Corp., Pompton Plains, N. J.
Helical Tube Corp., Grand Rapids, Mich.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Penn Brass & Copper Co., Erie, Pa.
Phelps Dodge Copper Products Corp., New York, N. Y.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Revere Copper and Brass Inc., New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Roberts Tube Div., Prestyle Mfg. Co., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Scovill Mfg. Co., Waterville Div., Waterville, Conn. (copper base)
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis. (stainless)
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

TUBES, PITOT

Defender Instrument and Regulator Co., Boody, Ill.
Dwyer Mfg. Co., F. W., Michigan City, Ind.
Ellison Draft Gage Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Meriam Instrument Co., The, Cleveland, O.
Simplex Valve & Meter Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

TUBING, ALUMINUM

Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
Bohn Aluminum & Brass Corp., Detroit, Mich.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
H & H Tube & Mfg. Co., Detroit, Mich.
Harvey Aluminum, Torrance, Calif.
Kaiser Aluminum & Chemical Sales, Inc., Chicago, Ill.
Penn Brass & Copper Co., Erie, Pa.
Revere Copper and Brass Inc., New York, N. Y.
Roberts Tube Div., Prestyle Mfg. Co., Detroit, Mich.
Reynolds Metals Co., Louisville, Ky.
Sawhill Tubular Products, Inc., Sharon, Pa.
United Wire & Supply Corp., Cranston, R. I.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
Youngstown Welding & Engineering Co., Youngstown, O.

TUBING BENDERS

See Benders, Tubing

TUBING, BRASS AND COPPER

American Brass Co., Waterbury, Conn.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Gardiner Metal Co., Chicago, Ill.
H & H Tube & Mfg. Co., Detroit, Mich.
Helical Tube Corp., Grand Rapids, Mich.
Hussey & Co., C. G., Div. of Copper Range Co., Pittsburgh, Pa.
Keeney Mfg. Co., Newington, Conn. (Chrome plated)
Kensico Tube Co., Mt. Kisco, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead covered)
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Penn Brass & Copper Co., Erie, Pa.
Phelps Dodge Copper Products Corp., New York, N. Y.
Reading Tube Corp., New York, N. Y.
Revere Copper and Brass Inc., New York, N. Y.
Roberts Tube Div., Prestyle Mfg. Co., Detroit, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (K-L-M)
United Wire & Supply Corp., Cranston, R. I.
Viking Copper Tube Co., Cleveland, O.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.
Young Regulator Co., Cleveland, O.

TUBING, BRONZE

American Brass Co., Waterbury, Conn.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Helical Tube Corp., Grand Rapids, Mich.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Revere Copper and Brass Inc., New York, N. Y.

TUBING, CAPILLARY

Allin Mfg. Co., Chicago, Ill.
American Brass Co., Waterbury, Conn.
Brass & Copper Imports, Inc., Minneapolis, Minn.
Kenisco Tube Co., Mt. Kisco, N. Y.
Madden Brass Products Co., Aurora, Ill.
Penn Brass & Copper Co., Erie, Pa.
Revere Copper and Brass Inc., New York, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Superior Tube Co., Norristown, Pa.
Techniflex Corp., Port Jervis, N. Y.
United Wire & Supply Corp., Cranston, R. I.
Wabash Corp., Chicago, Ill.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.

TUBING CUTTERS

See Cutters, Tubing

TUBING, DUPLEX

American Brass Co., Waterbury, Conn. (copper/steel admiralty/ steel)
Bridgeport Brass Co., Bridgeport, Conn. (copper steel, admiralty steel)
Phelps Dodge Copper Products Corp., New York, N. Y. (copper alloy)
Polymer Corp. of Pa., The, Reading, Pa. (nylon)
Republic Steel Corp., Steel & Tubes Div., Cleveland, O. (Steel and copper)
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.

TUBING, FABRIC, FLEXIBLE

Arrowhead Rubber Co., Long Beach, Calif.
Flexible Tubing Corp., Guilford, Conn.
Johns-Manville, New York, N. Y.

TUBING, FINNED

Brown Fintube Co., The, Elyria, O.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Edwards Engineering Corp., Pompton Plains, N. J.
G. & O. Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lewis & Saunders, Lakeport, N. H.
McCord Corp., Detroit, Mich.
Peerless of America, Inc., Chicago, Ill.
Quaid Fabrications, Inc., Philadelphia, Pa.
Rempe Co., Chicago, Ill.
Rome-Turney Radiator Co., Rome, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Tenney Engineering, Inc., Union, N. J.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United Machinery Sales Co., Chicago, Ill.
United Wire & Supply Corp., Cranston, R. I.
Vapor Heating Corp., Chicago, Ill.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Detroit, Mich. (Aluminum, copper)

TUBING, MAGNESIUM

Dow Chemical Co., The, Midland, Mich.

TUBING, METAL, FLEXIBLE

Aeroquip Corp., Jackson, Mich.
American Metal Hose Div., American Brass Co., The, Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York.
Cobra Metal Hose Div., Chicago, Ill.
Flexonics Corp., Maywood, Ill.
International Metal Hose Co., Bellevue, O.
Johnson Metal Hose, Inc., Waterbury, Conn.
Marquette Coppersmithing Co., Philadelphia.
National Lead Co., New York, N. Y.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Titeflex, Inc., East Springfield, Mass.
United Metal Hose Co., Inc., Long Island City, N. Y.
Universal Metal Hose Co., Chicago, Ill.

TUBING, NICKEL AND NICKEL ALLOY

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Bundy Tubing Co., Detroit, Mich.
Chase Brass & Copper Co., Waterbury, Conn.
Damascus Tube Co., Greenville, Pa.
Electric Steel Foundry Co., Portland, Ore.

General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Helical Tube Corp., Grand Rapids, Mich.
International Nickel Co., Inc., The, New York, N. Y.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Revere Copper and Brass, Inc., New York, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Superior Tube Co., Norristown, Pa.
Titeflex, Inc., East Springfield, Mass.
Trent Tube Co., East Troy, Wis.
United Wire & Supply Corp., Cranston, R. I.
Wolverine Tube, Div. of Calumet and Hecla, Inc., Detroit, Mich.
Youngstown Welding & Engineering Co., Youngstown, O.

TUBING, NICKEL PLATED

Nikoh Tube Co., Chicago, Ill.

TUBING, PLASTIC

Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Agile Corp., Bedford, O. (flexible)
American Hard Rubber Co., New York, N. Y.
Anesite Co., Skokie, Ill (polyethylene, butyrate)
Bakelite Co., Div. of Union Carbide & Carbon Chemical Co., New York, N. Y.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass. (PVC)
Carlon Products Corp., Cleveland, O.
Commercial Plastics Co., Chicago, Ill.
Continental Can Co., Millsplastic Pipe Div., New York, N. Y.
Continental-Diamond Div. of The Budd Co., Inc., Newark, Del.
Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind. (flexible)
Extruded Plastics, Inc., Norwalk, Conn.
Flexible Tubing Corp., Guilford, Conn.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y. (teflon)
Gates Rubber Co., The, Denver, Colo.
General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass. (phenolic laminated)
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O. (flexible and rigid)
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hartwell & Son, Inc., H. N., Boston, Mass. (PVC)
Haveg Industries, Inc., Newark, Del. (teflon)
Hudson Industries, Inc., Detroit, Mich.
Imperial Brass Mfg. Co., Chicago, Ill. (polyethylene and nylon)
Irvington Varnish and Insulator, Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Jaco Mfg. Co., Cleveland, O.
Jarrow Products, Chicago, Ill. (vinyl plastic)
LaFavorite Rubber Mfg. Co., Hawthorne, N. J. (rigid, PVC)
Luzerne Rubber Co., Trenton, N. J. (hard rubber)
Manufacturers Corp., Mansfield, O.
Moore & Co., Samuel, Mantua, O. (polyethylene)
Mueller Brass Co., Port Huron, Mich. (polyethylene)
Munray Products, Inc., Cleveland, O. (polyethylene, vinyl)
National Tube Div., United States Steel Corp., Pittsburgh, Pa. (polyethylene flexible polyvinyl chloride rigid)
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif. (fibre and bakelite)
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif. (butyrate; polyethylene; acrylic; PVC; rigid; flexible)
Polymer Corp. of Pa., The, Reading, Pa. (Nylon)
Pyramid Plastics, Inc., Chicago, Ill. (saran)
Reflin Co., San Diego, Calif. (rigid, reinforced with glass fibers)
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O. (Vinyl)
Resistoflex Corp., Roseland, N. J.
Richland Co., Mansfield, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill. (PVC)
Sandee Mfg. Co. Chicago, Ill. (all thermoplastic)
Saran Lined Pipe Co., Ferndale, Mich. (saran)
Skyline Industries, Titusville, Pa.
Southern Plastics Co., Columbia, S. C. (rigid, non-rigid)
Titeflex, Inc., East Springfield, Mass. (Teflon)
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (flexible polyethylene, semi-rigid, rigid high impact)
United States Rubber Co., New York, N. Y. (extruded)
United States Stoneware Co., New York.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Vanton Pump & Equipment Corp., Hillside, N. J. (vinyl-Polethylene)
Western Plastics Corp., Tacoma, Wash. (polyethylene)
Yardley Plastics Co., Columbus, O. (polyethylene, black)

TUBING, RUBBER

Garlock Packing Co., Palmyra, N. Y.
Goodrich Industrial Products Co., B. F., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins, Inc., Stamford, Conn.
Jarrow Products, Chicago, Ill. (sponge)
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
United States Rubber Co., New York, N. Y. (extruded)

TUBING, SILVER CLAD AND SILVER ALLOY

American Platinum Wks., Newark, N. J.
Baker & Co., Inc., Newark, N. J.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.

TUBING, STEEL, ALLOY, SEAMLESS

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
H & H Tube & Mfg. Co., Detroit, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Pittsburgh Steel Co., Pittsburgh, Pa.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Superior Tube Co., Norristown, Pa.
Timken Roller Bearing Co., Canton, O.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.

TUBING, STEEL, ALLOY, WELDED

Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Duraloy Co., Scottdale, Pa.
H & H Tube & Mfg. Co., Detroit, Mich.
Laclede Steel Co., St. Louis, Mo.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Trent Tube Co., East Troy, Wis.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering Co., Youngstown, O.

TUBING, STEEL, BRAZED

Bundy Tubing Co., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Wolverine Tube, Div. of Calumet & Hecla, Inc., Detroit, Mich.

TUBING, STEEL, SEAMLESS

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Central Steel & Wire Co., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Phoenix Iron & Steel Co., Phoenixville, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Superior Tube Co., Norristown, Pa.
Timken Roller Bearing Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

TUBING, STEEL, STAINLESS

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
American Cast Iron Pipe Co., Birmingham, Ala.
Autoclave Engineers Sales Corp., Erie, Pa.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Electric Steel Foundry Co., Portland, Ore.
Helical Tube Corp., Grand Rapids, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Pypon Co., Pittsburgh, Pa.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Stainless Welded Products, Inc., Clifton, N. J.
Standard Tube Co., Detroit, Mich.
Superior Tube Co., Norristown, Pa.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engrg. Co., Youngstown, O.

TUBING, STEEL, WELDED

American Pipe & Steel Corp., Alhambra, Calif.
Armco Steel Corp., Middletown, O.
Avon Tube Div., Higbe Mfg. Co., Rochester, Mich.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bundy Tubing Co., Detroit, Mich. (solder coated)
Central Steel & Wire Co., Chicago, Ill.
Chicago Metal Mfg. Co., Chicago, Ill.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
H-P Products, Inc., Louisville, O.
Jones & Laughlin Steel Corp., Pittsburgh, Pa. (electricwelded)
Laclede Steel Co., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Nikoh Tube Co., Chicago, Ill.
Pacific Tube Co., Los Angeles, Calif.
Pittsburgh Tube Co., Pittsburgh, Pa.
Radiant Heat and Cooling Co., Santa Clara, Calif.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Revere Copper and Brass, Inc., New York, N. Y.
Ryerson & Son, Inc., Joseph T., Chicago, Ill.
Sawhill Tubular Products, Inc., Sharon, Pa.
Sharon Steel Corp., Sharon, Pa.
South Chester Tube Co., Chester, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis.
Wheatland Tube Co., Philadelphia, Pa.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering Co., Youngstown, O.

TUBING, TITANIUM

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Harvey Aluminum, Torrance, Calif.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.

Superior Tube Co., Norristown, Pa.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering Co., Youngstown, O.

TUBING, ZIRCONIUM

Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Crucible Steel Co. of America, Pittsburgh, Pa.
Damascus Tube Co., Greenville, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Superior Tube Co., Norristown, Pa.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering Co., Youngstown, O.

TURBINES, MECHANICAL DRIVE

Carling Turbine Blower Co., Worcester, Mass.
Coffin Co., J. S., Jr., Englewood, N. J.
Coppus Engineering Corp., Worcester, Mass.
Dean Hill Pump Co., Indianapolis, Ind.
Elliott Co., Jeannette, Pa.
General Electric Co,. Apparatus Sales Div., Schenectady, N. Y.
Murray Iron Wks. Co., Burlington, Ia.
Pyle-National Co., The, Chicago, Ill.
Solar Aircraft Co., San Diego, Calif.
Steam Turbine Div., Worthington Corp., Wellsville, N. J.
Terry Steam Turbine Co., Hartford, Conn.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whiton Machine Co., New London, Conn.
Wing Mfg. Co., L. J., Linden, N. J.
Worthington Corp., Harrison, N. J.

2, 3 AND 4-WAY VALVES

See Valves, 2, 3 and 4-way

ULTRASONIC DUST AND FUME COLLECTION

See Collection, Dust and Fume, Ultrasonic

ULTRAVIOLET LAMPS

See Lamps, Sterilizing for Duct Installation; Units, Sterilizing, Air

UNDERGROUND PIPING

See Conduit, Underground Piping

UNDERWATER HEATERS

See Heaters, Steam Jet, for Liquids

UNIONS, BRASS

Acheson Mfg. Co., Rankin, Pa.
American Sanitary Mfg. Co., Abingdon, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
King Union Co., Inc., Hillsgrove, R. I.
Leavitt Machine Co., Orange, Mass.
Moran Flexible Joint Co., Div. of Railroad Products Co., Cincinnati, O.
Mueller Brass Co., Port Huron, Mich.
New York Brass Foundry, New York, N. Y.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Rhode Island Fittings Co., Providence, R. I.
Span Brass Mfg. Co., Otsego, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Metal Works Co., Inc., Chelsea, Mass.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.

UNIONS, INSULATING

See Joints, Pipe, Electrical Insulating

UNIONS, MALLEABLE, BRASS SEAT

Beaton & Corbin Mfg. Co., Southington, Conn.
Corley Co., Inc., The, New York, N. Y.
Crane Co., Chicago, Ill.
Dart Union Co., Providence, R. I.
Das Div. of The Zeller Corp., Defiance, O.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Fairbanks Co., The, New York, N. Y.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
General Fittings Co., East Greenwich, R. I.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Jefferson Union Co., New York, N. Y.
King Union Co., Inc., Hillsgrove, R. I.
Malleable Iron Fittings Co., Branford, Conn.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Rhode Island Fittings Co., Providence, R. I.
Rockwood Sprinkler Co., Worcester, Mass.
Roylyn, Inc., Glendale, Calif.
Stockham Valves & Fittings, Birmingham, Ala.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.

UNIONS, ORIFICE

Catawissa Valve & Fittings Co., Catawissa, Pa.
Dahl, G. W., Bristol, R. I.
Foxboro Co., Foxboro, Mass.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Roylyn, Inc., Glendale, Calif.
Taylor Forge & Pipe Wks., Chicago, Ill.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Walworth Co., New York, N. Y.

UNIONS, STEEL

Anchor Coupling Co., Inc., Libertyville, Ill.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Chiksan Co., Brea, Calif.
Clayton Mark & Co., Evanston, Ill.
Crane Co., Chicago, Ill.
Dart Union Co., Providence, R. I.
Das Div. of The Zeller Corp., Defiance, O.
Fairbanks Co., The, New York, N. Y.
Frick Co., Waynesboro, Pa.
Gilbert Brass Foundry Co., St. Louis, Mo.
Gray Tool Co., Houston, Tex.
Hasco Valve & Machine Co., Milwaukee, Wis. (Stainless steel and alloy only)
Henry Valve Co., Melrose Park, Ill.
Ladish Co., Cudahy, Wis.
Rockwood Sprinkler Co., Worcester, Mass.
Steel Improvement & Forge Co., The, Cleveland, O.
Vogt Machine Co., Henry, Louisville, Ky.
W-S Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Walworth Co., New York, N. Y.

UNIT COOLERS

See Coolers, Unit

UNIT HEATERS

See Heaters, Unit

UNIT VENTILATORS

See Ventilators, Unit

UNITS, AIR CONDITIONING, FOR AUTOMOBILES

A.R.A. Mfg. Co., Ft. Worth, Texas
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Frigidaire Div., General Motors Corp., Dayton, O.
Frigikar Corp., Dallas, Tex.
Great Northern Mfg. Corp., Chicago, Ill.
Harrison Radiator Div., General Motors, Lockport, N. Y.
Keco Industries, Inc., Cincinnati, O.
Kool-Kar Co., Inc., Detroit, Mich.
Mitchell Co., John E., Dallas, Tex.
Thermador Electrical Mfg., Los Angeles, Calif.

UNITS, AIR CONDITIONING, BUS, TRUCK AND TRAILER

A.R.A. Mfg. Co., Ft. Worth, Texas.
Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Ellis & Watts Products Inc., Cincinnati, O.
Frigikar Corp., Dallas, Tex.
Keco Industries, Inc., Cincinnati, O.
McGraw Electric Co., Clark Div., Chicago, Ill.
Metal Products Eng., Inc., Los Angeles, Calif. (Truck only)
Thermo King Corp., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Waukesha Motor Co., Waukesha, Wis.

UNITS, AIR CONDITIONING, CENTRAL STATION TYPE

Self contained blower, heating and/or cooling coil, filter, humidifier unit for remote location and duct air distribution

Acme Industries, Inc., Jackson, Mich.
Addison Products Co., Addison, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
Alco Refrigeration Sales & Service, Inc., Cleveland, O.
Alton Mfg. Co., Dallas, Tex.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
American Thermal Industries, Inc., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Anetsberger Bros., Inc., Div. of Union Electric Corp., Northbrook, Ill.
Armstrong Furnace Co., Columbus, O.
Bahnson Co., Winston-Salem, N. C.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Blazer & Son, M., Passaic, N. J.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Brunner Mfg. Co., Utica, N. Y.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clarage Fan Co., Kalamazoo, Mich.
Clime-Matic Corp., South Norwalk, Conn.
Coleman Co., Inc., The, Wichita, Kans.
Cool-Ette, Inc., Detroit, Mich.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Deering Air Conditioning Co., The, Cincinnati, O.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Ellis & Watts Products, Inc., Cincinnati, O.
Friedrich Refrigerators, Inc., San Antonio, Tex.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati.
General Air Conditioning Corp., Los Angeles, Calif.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.
Gibson Refrigerator Co., Greenville, Mich.
Gilbert & Barker Mfg. Co., West Spring, Mass.
Governair Corp., Oklahoma City, Okla.
Hastings Air Control, Inc., Omaha, Nebr.
Henry Furnace Co., Medina, O.
Howe Ice Machine Co., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Keco Industries, Inc., Cincinnati, O.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lennox Industries, Inc., Columbus, O.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Midwest Air Conditioning Co., Des Moines, Ia.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Palmer Mfg. Corp., Phoenix, Ariz.
Parks-Cramer Co., Fitchburg, Mass.
Payne Div. of Carrier Corp., Monrovia, Calif.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles.
Remington Air Conditioning Div., Remington

Corp., Auburn, N. Y.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Servel, Inc., Evansville, Ind. (absorption type)
Silco Products, Inc., Minneapolis, Minn.
Surface Combustion Corp., Toledo, O.
Thermal Engineering Corp., Houston, Tex.
Thermotank, Inc., Products Div., Detroit, Mich.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United States Air Conditioning Corp., Philadelphia, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, EXCLUSIVELY FOR HOSPITAL OPERATING ROOMS, WITH EXPLOSIONPROOF MOTOR

Marlo Coil Co., St. Louis, Mo.
Niagara Blower Co., New York, N. Y.
Trane Co., The, La Crosse, Wis.
Worthington Corp., Harrison, N. J.

UNITS, AIR CONDITIONING, HORIZONTAL PACKAGE TYPE

Self contained blower, cooling and/or heating coil, filter, humidifier unit for ceiling or platform location in space conditioned, for connection to remote compressor or cold water supply, and steam or hot water

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
Airtron Corp., Holland, O.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Coils Co., Newark, N. J.
American Thermal Industries, Inc., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Bahnson Co., Winston-Salem, N. C.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Besser Metal Products Corp., Charlotte, N. C.
Blazer & Son, M., Passaic, N. J.
Brown Products Corp., Forest Hills, N. Y.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Clime-Matic Corp., South Norwalk, Conn.
Combustion Engineering Inc., New York, N. Y.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Buffalo, N. Y.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
General Electric Co., Air Conditioning Div., Bloomfield, N. J. (ceiling mounted)
General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.
Governair Corp., Oklahoma City, Okla.
Hastings Air Control, Inc., Omaha, Nebr.
International Mfg. Co., Oklahoma City, Okla.
Iron Fireman Mfg. Co., Cleveland, O.
Kennard Corp., St. Louis, Mo.
King Co. of Owatonna, The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lennox Industries Inc., The, Marshalltown, Ia.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Midwest Air Conditioning Co., Des Moines, Ia.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Payne Div. of Carrier Corp., Monrovia, Calif.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Tenney Engineering, Inc., Union, N. J.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United States Air Conditioning Corp., Philadelphia, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Williamson Co., Cincinnati, O.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, INDUSTRIAL TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
American Thermal Industries, Inc., Detroit, Mich.
Anetsberger Bros., Inc., Northbrook, Ill.
Armstrong Furnace Co., Div. of Union Electric Corp., Columbus, O.
Bahnson Co., Winston-Salem, N. C.
Bal-Air, Inc., Nashville, Tenn.
Bishop & Babock Mfg. Co., Cleveland, O.
Blazer & Son, M., Passaic, N. J.
Buffalo Forge Co., Buffalo, N. Y.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clarage Fan Co., Kalamazoo, Mich.
Clime-Matic Corp., South Norwalk, Conn.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Frick Co., Waynesboro, Pa.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.
Governair Corp., Oklahoma City, Okla.
Haertel Co., Walter, Minneapolis, Minn.
Howe Ice Machine Co., Chicago, Ill.
Kennard Corp., St. Louis, Mo.
King Co. of Owatonna, The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lintern Corp., Painesville, O.
McQuay, Inc., Minneapolis, Minn.
Midwest Air Conditioning Co., Des Moines, Ia.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Simplaire, New York, N. Y.
Surface Combustion Corp., Toledo, O.
Thermal Engineering Corp., Houston, Tex.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United States Air Conditioning Corp., Philadelphia, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, REVERSE REFRIGERATION CYCLE

Acme Industries, Inc., Jackson, Mich.
American Coils Co., Newark, N. J.
Brunner Mfg. Co., Utica, N. Y.
Drying Systems, Inc., Chicago, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Buffalo, N. Y.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.
Mitchell Mfg. Co., Chicago, Ill.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Typhoon Heat Pump Co., Div. of Hupp Corp., Tampa, Fla.
Weather King of Florida, Inc., Orlando, Fla.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

UNITS, AIR CONDITIONING, SUMMER, EVAPORATIVE COOLING TYPE

For cooling by evaporation, no dehumidification

Air-Cooling Engineering Co., Evanston, Ill.
Air Equipment Co., Denver, Colo.
Air Fan Engineering Co., Los Angeles, Calif.
Air & Refrigeration Corp., New York, N. Y.
Alton Mfg. Co., Dallas, Tex.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
American Moistening Co., Providence, R. I.
Bahnson Co., Winston-Salem, N. C.
Barwick Mfg. Corp., Wichita, Kan.
Buensod-Stacey, Inc., New York, N. Y.
Campbell Co., E. K., Kansas City, Mo.
Carrier Corp., Syracuse, N. Y.
Comfort Products Inc., Dallas, Tex.
Dearborn Stove Co., Dallas, Tex.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Essick Mfg. Co., Los Angeles, Calif.
Farr Co., Los Angeles, Calif.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Heating Assurance, Inc., Spokane, Wash.
International Metal Products Co., Phoenix, Ariz.
Kleer Kleen Mfg. Co., Hayward, Calif.
Lennox Industries, Inc., Marshalltown, Ia.

Martin Fan & Blower Co., Chicago, Ill.
Mountain States Equipment Co., Denver, Colo.
National Engineering & Mfg. Co., Sedalia, Mo.
National Gas Equipment Co., Inc., Denison, Tex.
Palmer Mfg. Co., Phoenix, Ariz.
Pioneer Furnace Co., Los Angeles, Calif.
R. I. Humidifier & Ventilating Co., Inc., Cambridge, Mass.
Thermador Electrical Mfg., Los Angeles, Calif.
Thermo-Mat Co., Los Angeles, Calif. (aspen fiber replacement mats)
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United Electric Co., Wichita Falls, Tex.
Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Wright Mfg. Co., Phoenix, Ariz.
X L Refrigerating Co., Chicago, Ill.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER, UNDER 3 TONS CAPACITY

Self contained blower, coil, filter unit for connection to remote compressor or cold water supply

Acme Industries, Inc., Jackson, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Air-temp Construction, Div. of Chrysler Corp., Dayton, O.
Airtron Corp., Holland, O.
Bal-Air, Inc., Nashville, Tenn.
Blazer & Son, M., Passaic, N. J.
Brown Products Corp., Forest Hills, N. Y.
Carlen Associates, New York, N. Y.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Clime-Matic Corp., South Norwalk, Conn.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Ejay Baseboard Mfg. Co., Winsted, Conn.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Hastings Air Control, Inc., Omaha, Neb.
International Mfg. Co., Oklahoma City, Okla.
Kennard Corp., St. Louis, Mo.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lennox Industries, Inc., Marshalltown, Ia.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Mitchell Mfg. Co., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
Round Oak Co., Inc., Dowagiac, Mich.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Tenney Engineering, Inc., Union, N. J.
ThermoRay Corp., Newark, N. J.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Philadelphia, Pa.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Williamson Co., Cincinnati, O.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, UNDER 3 HP

Self contained blower, coil, compressor, filter unit

Air Conditioning Engineering Co., Cambridge, Mass.
Airtron Corp., Holland, O.
Ajax Corp. of America, Evansville, Ind.
Armstrong Furnace Co., Div. of Union Electric Corp., Columbus, O.
Automatic Corp., St. Louis, Mo.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Cool-Ette, Inc., Detroit, Mich.
Delta Heating Corp., Trenton, N. J.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Emerson-Quiet Kool Corp., Newark, N. J.
Fedders-Quigan Corp., Buffalo, N. Y.
General Air Conditioning Corp., Los Angeles, Calif.
Great Northern Mfg. Corp., Chicago, Ill.
Hotpoint Co., Chicago, Ill.
Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.
Mitchell Mfg. Co., Chicago, Ill.
Mueller Climatrol, Milwaukee, Wis.
Philco Corp., Philadelphia, Pa.
Primor Products, Div. Borg-Warner Corp., Adrian, Mich.
Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rinehart Inc., Richmond, Ind.
Round Oak Co., Inc., Dowagiac, Mich.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Surface Combustion Corp., Toledo, O.
Sutton Corp., O. A., The, Wichita, Kan.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United States Air Conditioning Corp., Philadelphia, Pa.
Viking Mfg. Corp., Cleveland, O.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

UNITS, AIR CONDITIONING, SUMMER, STORE TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, 3 HP AND OVER

Self contained blower, coil, compressor, filter unit with air discharge approximately 6 ft above floor

Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
Airtron Corp., Holland, O.
American Blower Corp., Detroit, Mich.
American Coils Co., Newark, N. J.
American Furnace Co., St. Louis, Mo.
American Standard, Air Conditioning Div., New York, N. Y.
American Thermal Industries, Inc., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Armstrong Furnace Co., Div. of Union Electric Corp., Columbus, O.
Automatic Corp., St. Louis, Mo.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Brunner Mfg. Co., Utica, N. Y.
Bryant, Div. of Carrier Corp., Indianapolis, Ind.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Coleman Co., Inc., The, Wichita, Kans.
Conditioned Air, Inc., Charleston, W. Va.
Cool-Ette, Inc., Detroit, Mich.
Crane Co., Chicago, Ill.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Delta Heating Corp., Trenton, N. J.
Frick Co., Waynesboro, Pa.
Friedrich Refrigerators, Inc., San Antonio, Tex.
Frigid, Inc., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, N. J.
Gibson Refrigerator Co., Greenville, Mich.
Governair Corp., Oklahoma City, Okla.
Great Northern Mfg. Corp., Chicago, Ill.
Hastings Air Control, Inc., Omaha, Nebr.
Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., New York, N. Y.
Koch Refrigerators, Inc., Kansas City, Kans.
Lennox Industries Inc., The, Marshalltown, Ia.
Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
Midwest Air Conditioning Co., Des Moines, Ia.
Mitchell Mfg. Co., Chicago, Ill.
Mueller Climatrol, Milwaukee, Wis.
Muncie Gear Wks., Inc., Muncie, Ind.
National-U. S. Radiator Corp., Johnstown, Pa.
Philco Corp., Philadelphia, Pa.
Primor Products, Div. Borg-Warner Corp., Adrian, Mich.
Round Oak Co., Inc., Dowagiac, Mich.
Surface Combustion Corp., Toledo, O.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United States Air Conditioning Corp., Philadelphia, Pa.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitehall Engineering Co., Inc., Chicago, Ill.
Williams Div., Eureka Williams Corp., Bloomington, Ill.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

UNITS, AIR CONDITIONING, SUMMER, WALL TYPE, SELF-CONTAINED, FOR MOUNTING THROUGH WALL ONLY

Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
Amic Mfg. Corp., Long Island City, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Coleman Co., Inc., The, Wichita, Kans.
Emerson-Quiet Kool Corp., Newark, N. J.
Fedders-Quigan Corp., Buffalo, N. Y.
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
General Electric Co., Appliance & Television Receiver Div., Louisville, Ky.
Kelvinator Div., American Motors Corp., Detroit, Mich.
Lewyt Air-Conditioner Corp., Brooklyn, N. Y.
Mueller Climatrol, Milwaukee, Wis.
Sutton Corp., O. A., The, Wichita, Kans.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.

UNITS, AIR CONDITIONING, WINDOW, FOR CASEMENT WINDOWS

Admiral Corp., Chicago, Ill.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O. (with provision for heating)
Deering Air Conditioning Co., The, Cincinnati, O.
Emerson-Quiet Kool Corp., Newark, N. J.
Fedders-Quigan Corp., Buffalo, N. Y.

Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Appliance & Television Receiver Div., Louisville, Ky.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Kelvinator Div., American Motors Corp., Detroit, Mich.
Mitchell Mfg. Co., Chicago, Ill.
National-U. S. Radiator Corp., Johnstown, Pa.
Perfection Industries Div., Hupp Corp., Cleveland, O.
Philco Corp., Philadelphia, Pa. (Heating element available)
Sutton Corp., O. A., The, Wichita, Ks.
Universal Major Electric Appliances, Inc., Baltimore, Md.
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass.

UNITS, AIR CONDITIONING, WINDOW, FOR DOUBLE-HUNG WINDOWS

Addison Products Co., Addison, Mich.
Admiral Corp., Chicago, Ill.
Air Conditioning Engineering Co., Cambridge, Mass.
Amana Refrigeration, Inc., Amana, Ia. (heating element included)
Automatic Corp., St. Louis, Mo.
Blissfield Mfg. Co., Blissfield, Mich.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Cauhorn Distributing Co., Detroit, Mich.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O. (with provision for heating)
Deepfreeze Appliance Div., Motor Products Corp., North Chicago, Ill. (some models have heating elements)
Deering Air Conditioning Co., The, Cincinnati, O.
Emerson Electric Mfg. Co., The, St. Louis, Mo. (reverse cycle)
Emerson-Quiet Kool Corp., Newark, N. J.
Emerson Radio and Phonograph Corp., Jersey City, N. J.
Fedders-Quigan Corp., Buffalo, N. Y.
Fresh'nd-Aire Company, Div. of Cory Corp., Chicago, Ill.
Friedrich Refrigerators, Inc., San Antonio, Tex.
Frigid, Inc., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Appliance & Television Receiver Div., Louisville, Ky.
Gibson Refrigerator Co., Greenville, Mich.
Great Northern Mfg. Corp., Chicago, Ill.
Hotpoint Co., Chicago, Ill.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
International Harvester Co., Chicago, Ill.
Kelvinator Div., American Motors Corp., Detroit, Mich.
King Refrigerator Co., Glendale, N. Y.
Lewyt Air-Conditioner Corp., Brooklyn, N. Y.
Mathes Co., The, Ft. Worth, Tex.
McGraw Electric Co., Lonergan Mfg. Div., Albion, Mich.
Mitchell Mfg. Co., Chicago, Ill.
National Engineering & Mfg. Co., Sedalia, Mo.
National Steel Construction Co., Logansport, Ind.
National-U. S. Radiator Corp., Johnstown, Pa.
Payne Div. of Carrier Corp., Monrovia, Calif.
Perfection Industries Div., Hupp Corp., Cleveland, O.
Philco Corp., Philadelphia, Pa. (heating element available)
Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Sub-Zero Freezer Co., Inc., Madison, Wis.
Sutton Corp., O. A., The, Wichita, Kan.
Universal Major Electric Appliances, Inc., Baltimore, Md.
Viking Mfg. Corp., Cleveland, O. (heating element optional)
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass. (with or without heating element)
Whirlpool-Seeger Corp., Evansville, Ind.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

UNITS, AIR CONDITIONING, WINTER, ROOM TYPE, FLOOR CABINET

Self contained blower, filter, heating coil, humidifier unit

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Auburn Burner Co., Auburn, Ind.
Bal-Air, Inc., Nashvile, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Buffalo Forge Co., Buffalo, N. Y.
Campbell Heating Co., Des Moines, Ia.
Clarage Fan Co., Kalamazoo, Mich.
Dalzen Mfg. Co., St. Clair, Mich.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Johnson Co., S. T., Oakland, Calif.
Kehm Corp., The, Chicago, Ill.
Kennard Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Mitchell Mfg. Co., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Surface Combustion Corp., Toledo, O.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
United States Air Conditioning Corp., Philadelphia, Pa.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

UNITS, AIR CONDITIONING, YEAR AROUND, FAN-COIL TYPE, FOR INSTALLATION WITH OR WITHOUT CABINET IN ROOM, OR IN CLOSET SPACE, OVER CORRIDOR, ETC.

(*Comprises Blower, Chilled Water Direct Expansion or Hot Water Coil, for Connection to Remote Compressor or Chilled Water Supply*)

Acme Industries, Inc., Jackson, Mich.
Airtherm Mfg. Co., St. Louis, Mo.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Blazer & Son, M., Passaic, N. J.
Brown Products Corp., Forest Hills, N. Y.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Coleman Co., Inc., The, Wichita, Kans.
Deansteel Products Co., San Antonio, Texas.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
McQuay, Inc., Minneapolis, Minn.
Mitchell Mfg. Co., Chicago, Ill.
Mueller Climatrol, Milwaukee, Wis.
National-U. S. Radiator Corp., The, Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Philadelphia, Pa.
Viking Mfg. Corp., Cleveland, O.
Weil-McLain Co., Michigan City, Ind.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Witt Co., A. H., Los Angeles, Calif.
Worthington Corp., Harrison, N. J.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET

Self contained blower, cooling and heating coil, filter, humidifier unit for connection to remote compressor or cold water supply, and steam or hot water supply

Acme Industries, Inc., Jackson, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtemp Construction, Div. of Chrysler Corp., Dayton, O.
Airtron Corp., Holland, O.
American Coils Co., Newark, N. J.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Blazer & Son, M., Passaic, N. J.
Brown Products Corp., Forest Hills, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Circle Air Industries, Inc., Brooklyn, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Clime-Matic Corp., Norwalk, Conn.
Curtis Mfg. Co., Refrigeration Div., St. Louis, Mo.
Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Dunham-Bush, Inc., West Hartford, Conn.
Fedders-Quigan Corp., Heating Div., Trenton, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati.
Hastings Air Control, Inc., Omaha, Nebr.
Johnson Co., S. T., Oakland, Calif.
Kennard Corp., St. Louis, Mo.
Koch Refrigerators, Inc., Kansas City, Kans.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
National-U. S. Radiator Corp., Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Reco Div. of Schemenauer Mfg. Corp., Holland, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rittling Corp., The, Buffalo, N. Y.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.
United States Air Conditioning Corp., Philadelphia, Pa.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET

(*Self Contained Compressor, Blower, Filter, Cooling Coils and Heating Coils for Connection to Steam or Hot Water Supply*)

General Electric Co., Appliance & Television Receiver Div., Louisville, Ky.
Mueller Climatrol, Milwaukee, Wis.
Webster & Co., Warren, Camden, N. J.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET, INDUCTION

Self-Contained Cooling and Heating Coil, Filter, Etc. for Connection to High Pressure Primary Air Supply, Cold Water Supply, and Hot Water Supply

American Blower Corp., Detroit, Mich.
Barkow Mfg. Co., Inc., Aug. C., Milwaukee.
Blazer & Son, M., Passaic, N. J.
Carrier Corp., Syracuse, N. Y.
Circle-Air Industries, Inc., Brooklyn, N. Y.
Deering Air Conditioning Co., The, Cincinnati, O.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Worthington Corp., Harrison, N. J.

UNITS, CONDENSATE DISPOSAL, FOR AIR CONDITIONING

See Pumps, Condensate, For Removing Condensation from Air Conditioning Units

UNITS, FUEL OIL, HEATING, PUMPING AND STRAINING

Ace Engineering Co., Chicago, Ill.
Alco Products, Inc., Schenectady, N. Y.
Barclay, Inc., Robert, Chicago, Ill.
Canton Stoker Corp., Canton, O.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Drying Systems, Inc., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Engineer Co., New York, N. Y.
Faber Engineer Co., Inc., Philadelphia, Pa.
Hite Mfg. Co., N. E., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Kingsley Mfg. Co., New Haven, Conn. (tester for)
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Minneapolis, Minn.
Peabody Engineering Corp., New York, N. Y.
Petro, Cleveland, O.
Preferred Utilities Mfg. Corp., New York, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Staples & Pfeiffer, San Francisco, Calif.
Todd Shipyards Corp., Products Div., Brooklyn, N. Y.
Tuthill Pump Co., Chicago, Ill.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Webster Electric Co., Racine, Wis.
Wiegand Co., Edwin L., Pittsburgh, Pa. (electric)
Wilson Engineering Corp., Chicago, Ill.

UNITS, HEAT RECOVERY, AIR-TO-AIR

Air Conditioning Engineering Co., Cambridge, Mass.
Heatube Corp., Allegan, Mich.
Therm-O-Wheel, Inc., Far Rockaway, N. Y.
Typhoon Air Conditioning Co., Div. of Hupp Corp., Brooklyn, N. Y.

UNITS, MIXING, SOUND AND VOLUME CONTROL, FOR DOUBLE DUCT HIGH VELOCITY AIR CONDITIONING SYSTEM

Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Buensod-Stacey, Inc., New York, N. Y.
Connor Engineering Corp., Danbury, Conn.
Thermotank, Inc., Products Div., Detroit, Mich.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.

UNITS, STERILIZING, AIR

Air Purification Service, Inc., New York, N. Y.
Cooper Hewitt Electric Co., Hoboken, N. J.
Dryomatic Corp., Alexandria, Va.
Germatrol Corp., Pittsburgh, Pa.
Glycolator Sales & Service, Pittsburgh, Pa.
Hanovia Chemical & Mfg. Co., Newark, N. J.
Kewaunee Mfg. Co., Adrian, Mich.
Sampson Chemical & Pigment Corp., Chicago, Ill.
Sperti, Faraday, Inc., Hoboken, N. J.

UNITS, STERILIZING, WATER

Hanovia Chemical & Mfg. Co., Newark, N. J.

UNITS, WINDOW VENTILATOR AND FILTER

Airgard Mfg. Co., Chicago, Ill.
Air-Net Appliance Corp., Chicago, Ill. (with heating unit)
Colt Ventilation Co. of America, Inc., Los Angeles, Calif.
Goodwill Mfg. Co., Chicago, Ill.
Ilg Electric Ventilating Co., Chicago, Ill.
Meir Electric & Machine Co., Inc., Indianapolis, Ind.
Palmer Mfg. Corp., Phoenix, Ariz.
Reed Unit-Fans, Inc., New Orleans, La.
Standard Electric Mfg. Co., West Berlin, N. J.
Utility Appliance Corp., Los Angeles, Calif.

UNIVERSAL JOINTS

See Joints, Universal, for Operating Valves

VACUUM CLEANERS FOR BOILERS

See Cleaners, Vacuum, for Boilers

VACUUM CLEANING SYSTEMS, FITTINGS FOR

See Fittings for Central Vacuum Cleaning Systems

VACUUM GAGES

See Gages, Indicating, Vacuum

VACUUM HEATING SYSTEMS

See Systems, Heating, Vacuum

VACUUM PUMPS

See Pumps, Vacuum

VACUUM RECORDERS

See Recorders, Pressure and Vacuum

VALVE OPERATORS

See Operators, Valve

VALVE RESEATERS

See Reseaters, Valve

VALVES, AIR OPERATING

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Airmatic Valve, Inc., Cleveland, O.
American Moistening Co., Providence, R. I.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co, Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barksdale Valves, Los Angeles, Calif.
Binks Mfg. Co., Chicago, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Clark Controller Co., Cleveland, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
De Zurik Shower Co., Sartell, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edward Valves, Inc., East Chicago, Ind.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hammel-Dahl Co., Providence, R. I.
Hanna Engineering Wks., Chicago, Ill.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloys)
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Ledeen Mfg. Co., Los Angeles, Calif.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
McAlear Mfg. Co., Chicago, Ill.
McRae Specialty Co., Don, Glendale, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Norwalk Valve Co., South Norwalk, Conn.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Powell Co., Wm., The, Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Rockwood Sprinkler Co., Worcester, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Squires Co., C. E., The, Cleveland; O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco.
Uniflow Valve Corp., Cranford, N. J.
Vernon Tool Co., Ltd., Alhambra, Calif.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Inc., Birmingham, Ala.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Wilson Engineering Corp., Chicago, Ill.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, ANGLE

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Belknap Mfg. Co., Div. of Detroit Controls, Bridgeport, Conn.
Bordo Co., Inc., L. J., Glenside, Pa. (Plug)
Carpenter Valve Corp., The, Cleveland, O.
California Brass Mfg. Co., Los Angeles, Calif.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cla-Val Co., Newport Beach, Calif.
Cleveland Brass Mfg. Co., The, Cleveland, O.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
De Zurik Shower Co., Sartell, Minn.
Duriron Co., The, Dayton, O. (acid resisting)
Edward Valves, Inc., East Chicago, Ind.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Frick Co., Waynesboro, Pa.
Gas Machinery Co., Cleveland, O.
General Ceramics Corp., Keasbey, N. J. (porcelain; plastic, alumina)
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)
Haveg Industries, Inc., Newark, Del. (plastic and plastic body)
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
Lazerne Rubber Co., Trenton, N. J. (Hard Rubber)

Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Nason Co., Clarkston, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Mariemont, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Squires Co., C. E., The, Cleveland, O.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J. (plastic)
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, AUTOMATIC SHUTOFF WITH MANUAL RESET

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bryant Industrial Products Corp., Cleveland, O.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Newport Beach, Calif.
Coppus Engineering Corp., Worcester, Mass.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Maxon Premix Burner Co., Muncie, Ind.
McRae Specialty Co., Don, Glendale, Calif.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Norwalk Valve Co., South Norwalk, Conn.
P-K Industries, Inc., North Arlington, N. J.
Rockwell Co., W. S., Fairfield, Conn.
Roylyn, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Security Valves Corp., Glendale, Calif.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Squires Co., C. E., The, Cleveland, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Thermac Co., Los Angeles, Calif.
Valco, Inc., Cincinnati, O.
Vernon Tool Co., Ltd., Alhambra, Calif.
Watts Regulator Co., Lawrence, Mass.

VALVES, BACK PRESSURE

Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Charles M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bryant Industrial Products Corp., Cleveland, O.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Newport Beach, Calif.
Cochrane Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Fisher Governor Co., Marshalltown, Ia.
Hammel-Dahl Co., Providence, R. I.
Hershey Mfg. Co., South Boston, Mass.
Hubbell Corp., Mundelein, Ill.
Illinois Engrg. Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
McRae Specialty Co., Don, Glendale, Calif.
Milton Roy Co., Philadelphia, Pa.
Norwalk Valve Co., South Norwalk, Conn.
Pokorney Mfg. Co., Chicago, Ill.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schancke, Inc., Evansville, Ind.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Stickle Steam Specialties Co., Indianapolis, Ind.

VALVES, BALANCING, FOR FORCED HOT WATER HEATING SYSTEMS

Bell & Gossett Co., Morton Grove, Ill.
Detroit Controls Corp., Detroit, Mich.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
G & H Mfg. Co., Philadelphia, Pa.
Hammond Brass Works, Hammond, Ind.
Hi-Flow Products, Inc., Copiague, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Quality Specialty Co., Inc., Camden, N. J.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

VALVES, BALL TYPE

Cardox Corp., Chicago, Ill.
Carpenter Sales Corp., Cleveland, O.
Carpenter Valve Corp., The, Cleveland, O.
Edward Valves, Inc., East Chicago, Ind.
Fairbanks Co., The, New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Multiplex Mfg. Co., Berwick, Pa.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Rockwell Co., W. S., Fairfield, Conn.
Rockwood Sprinkler Co., Worcester, Mass.
Smith Co., S. Morgan, York, Pa.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, BAR STOCK

Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Orange, N. J.
Carpenter Sales Corp., Cleveland, O.
Carpenter Valve Mfg. Co., The, Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Circle Seal Products Co., Inc., Pasadena, Calif.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Farris Engineering Corp., Palisades Park, N. J.
Foxboro Co., Foxboro, Mass.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grove Valve and Regulator Co., Oakland, Calif.
Guardian Products Corp., Michigan City, Ind.
Hammel-Dahl Co., Providence, R. I.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwood Sprinkler Co., Worcester, Mass.
Shank Co., Cyrus, Chicago, Ill.
Star Stainless Screw Co., Paterson, N. J.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, BLOW-OFF

Automatic Switch Co., Orange, N. J.
Bardo Co., Inc., L. J., Glenside, Pa.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Edward Valves, Inc., East Chicago, Ind.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Gato Valve Co., Pittsburgh, Pa.
Henszey Co., Watertown, Wis.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Madden Corp., The, Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonnell & Miller, Inc., Chicago, Ill.
Norgren Co., C. A., Englewood, Colo.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Shank Co., Cyrus, Chicago, Ill.
Strong, Carlisle & Hammond, Cleveland, O.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Wilson Engineering Corp., Chicago, Ill.
Yarnall-Waring Co., Philadelphia, Pa.

VALVES, BOILER, NON-RETURN

Crane Co., Chicago, Ill.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Lunkenheimer Co., Cincinnati, O.
McAlear Mfg. Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.

VALVES, BRAZED END

Fairbanks Co., The, New York, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.

Hammond Brass Works, Hammond, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Walworth Co., New York, N. Y.

VALVES, BUTTERFLY

Bryant Industrial Products Corp., Cleveland, O.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fabri-Valve Co. of America, Portland, Ore.
Fisher Govenor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
Gas Machinery Co., Cleveland, O.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware, plastic)
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)
Hauck Mfg. Co., Brooklyn, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Keystone Valve Corp., Houston, Tex.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y. (all iron for gas service)
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa.
North American Mfg. Co., Cleveland, O.
Norwalk Valve Co., South Norwalk, Conn.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Pratt Co., Henry, Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Roylyn, Inc., Glendale, Calif.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Smith Co., S. Morgan, York, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.
Worthington Corp., Harrison, N. J.

VALVES, BYPASS, WITH PROVISIONS FOR SOME CIRCULATION WHEN CLOSED

Fulflo Specialties Co., Inc., The, Blanchester, O.
Jenkins Bros., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Morrison Brothers Co., Dubuque, Ia.
Mueller Brass Co., Port Huron, Mich.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Powell Co., Wm., The, Cincinnati, O.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Stockham Valves & Fittings, Birmingham, Ala.

VALVES, CHECK

Alloy Steel Products Co., Linden, N. J. (stainless steel)
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
American Hard Rubber Co., New York, N. Y. (Hard rubber)
Aminco Refrigeration Products, American Injector Co., Detroit, Mich. (Refrigeration)
Amp Corp., St. Louis, Mo.
Associated Valve & Engineering Corp., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Barrett Haentjens & Co., Hazelton, Pa.
Belknap Mfg. Co., Div. of Detroit Controls, Bridgeport, Conn.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Cochrane Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Durabla Mfg. Co., New York, N. Y.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fairbanks Co., The, New York, N. Y.
Foster Engineering Co., Union, N. J.
Gas Machinery Co., Cleveland, O.
General Ceramics Corp., Keasbey, N. J. (ceramics)
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grinnell Co., Inc., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy only)
Hersey Mfg. Co., South Boston, Mass.
Imperial Brass Mfg. Co., Chicago, Ill.
Integral Corp., Hicksville, Long Island, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Keystone Valve Corp., Houston, Tex.
LaBour Co., Inc., The, Elkhart, Ind.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead lined)
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Cleveland, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McRae Specialty Co., Don, Glendale, Calif.
Miller Valve Co., Inc., Pittsburgh, Pa. (Silent)
Milwaukee Valve Co., Milwaukee, Wis.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Myers & Bro. Co., F. E., The, Ashland, O.
Norwalk Valve Co., South Norwalk, Conn.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Phillips & Co., H. A., Chicago, Ill.
Pokorney Mfg. Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Remco, Inc., Zelienople, Pa. (high pressure & low pressure)
Republic Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Roylyn, Inc., Glendale, Calif.
Schaible Co., The, Mariemont, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Smith Co., S. Morgan, York, Pa.
Smolensky Valve Co., Inc., Bedford, O.
Stockham Valves & Fittings, Birmingham, Ala.
Sullivan Valve & Engineering Co., Butte, Mont.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Valves, Inc., F. G., Milwaukee, Wis.
Vanton Pump & Equipment Corp., Hillside, N. J. (plastic)
Walworth Co., New York, N. Y.
Watts Regulator Co., Lawrence, Mass.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (Noiseless)
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, CHECK, BRONZE

Associated Valve & Engineering Co., Chicago.
Barrett Haentjens & Co., Hazelton, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Crane Co., Chicago, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fairbanks Co., The, New York, N. Y.
Foster Engineering Co., Union, N. J.
Grinnell Co., Inc., Providence, R. I.
Grove Valve & Regulator Co., Oakland, Calif.
Hammond Brass Wks., Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McRae Specialty Co., Don, Glendale, Calif.
Miller Valve Co., Inc., Pittsburgh, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia.
Morse-Smith-Morse Co., The, Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Myers & Bro. Co., F. E., The, Ashland, O.
Northern Indiana Brass Co., Elkhart, Ind.
Norwalk Valve Co., South Norwalk, Conn.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Rockford Brass Works, Rockford, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Roylyn, Inc., Glendale, Calif.
Schaible Co., The, Mariemont, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Sims Pump Valve Co., Hoboken, N. J.
Smolensky Valve Co., Inc., Bedford, O.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Valves, Inc., F. G., Milwaukee, Wis.
Walworth Co., New York, N. Y.
Watts Regulator Co., Lawrence, Mass.
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Gauge Co., Inc., Pittsburgh, Pa.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, CHECK, IRON

Barrett Haentjens & Co., Hazelton, Pa.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Cla-Val Co., Newport Beach, Calif.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Fairbanks Co., The, New York, N. Y.
Foster Engineering Co., Union, N. J.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Grove Valve & Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
McDonald Mfg. Co., A.Y., Dubuque, Ia.
McRae Specialty Co., Don, Glendale, Calif.

Miller Valve Co., Inc., Pittsburgh, Pa.
Mueller Co., Decatur, Ill.
Norwalk Valve Co., South Norwalk, Conn.
OPW Corp., Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Reading, Pa.
Roylyn, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Smolensky Valve Co., Inc., Bedford, O.
Stockham Valves & Fittings, Birmingham, Ala.
Valves, Inc., F. G., Milwaukee, Wis.
Walworth Co., New York, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

VALVES, CHECK, STEEL

Associated Valve & Engineering Co., Chicago.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Foster Engineering Co., Union, N. J.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grove Valve & Regulator Co., Oakland, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Jenkins Bros., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Cleveland, O.
McRae Specialty Co., Don, Glendale, Calif.
Miller Valve Co., Inc., Pittsburgh, Pa.
Norwalk Valve Co., South Norwalk, Conn.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Roylyn, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Smolensky Valve Co., Inc., Bedford, O.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Pipe & Mfg. Co., So. San Francisco, Calif.
Vernon Tool Co., Ltd., Alhambra, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh.

VALVES, COMPRESSOR

Binks Mfg. Co., Chicago, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Detroit Stamping Co., Detroit, Mich.
Durabla Mfg. Co., New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Mueller Brass Co., Port Huron, Mich.
OPW Corp., Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
Voss Co., J. H. H., Inc., New York, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, CYLINDER OPERATED

Airmatic Valve, Inc., Cleveland, O.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N .J.
Cardox Corp., Chicago, Ill.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Clow & Sons, Inc., James B., Chicago, Ill.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
DeZurik Shower Co., Sartell, Minn.
Everlasting Valve Co., Jersey City, N. J.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hammel-Dahl Co., Providence, R. I.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Jenkins Bros., New York, N. Y.
Leslie Co., Lyndhurst, N. J.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Pratt Co., Henry, Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Saran Lined Pipe Co., Ferndale, Mich. (saran lined)
Smith Co., S. Morgan, York, Pa.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, DIAPHRAGM
(Diaphragm controller elements controls opening of valve)

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
American Hard Rubber Co., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black,Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fabri-Valve Co. of America, Portland, Ore.
Farris Engineering Corp., Palisades Park, N. J.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Hills-McCanna Co., Chicago, Ill.
Hubbell Corp., Mundelein, Ill.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Skokie, Ill.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
North American Mfg. Co., Cleveland, O.
Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
P-K Industries, Inc., North Arlington, N. J.
Parks-Cramer Co., Fitchburg, Mass. (plain and jacketed)
Paul Valve Corp., New York, N. Y.
Powers Regulator Co., Skokie, Ill.
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Rockwell Co., W. S., Fairfield, Conn.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich.
Sarco Co., Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Squires Co., C. E., The, Cleveland, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Trerice Co., H. O., Detroit, Mich.
United States Rubber Co., New York, N. Y.
Valves, Inc., F. G., Milwaukee, Wis.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, DIAPHRAGM
(Diaphragm itself throttles or shuts off flow)

A-P Controls Div., Controls Corp. of America, Milwaukee. Wis.
Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Flow Control Corp., Houston, Tex.
American Hard Rubber Co., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Conoflow Corp., Subsidiary of Walworth Corp., Philadelphia, Pa.
Coppus Engineering Corp., Worcester, Mass.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware)
General Controls Co., Glendale, Calif.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Hunt & Son, Inc., C. B., Salem, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Keckley Co., O. C., Skokie, Ill.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modern Engineering Co., St. Louis, Mo.
Norwalk Valve Co., South Norwalk, Conn.
Penn Instruments Div. of Burgess-Manning Co., Philadelphia, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Security Valves Corp., Glendale, Calif.
Sullivan Valve & Engineering Co., Butte, Mont.
Trerice Co., H. O., Detroit, Mich.
Tube Turns Plastics, Inc., Louisville, Ky. (injection molded PVC)
United States Rubber Co., New York, N. Y.
Walworth Co., New York, N. Y. (plastic PVC diaphragm)
Warren Engineering Co., Broadway, N. J.
Weston Electrical Instruments Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
White-Rodgers Co., St. Louis, Mo.

VALVES, DIAPHRAGM
(Diaphragm used as seal between body and bonnet)

Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Hard Rubber Co., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Subsidiary of Walworth Corp., Philadelphia, Pa.

Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Duriron Co., Inc., The, Dayton, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Goodrich Industrial Products Co., B. F., Akron, O.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Co., Providence, R. I.
Haveg Industries, Inc., Newark, Del.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Klipfel Valves, Inc., Hamilton, O.
Knight, Maurice A., Akron, O. (molded resin for acids)
Leslie Co., Lyndhurst, N. J.
McRae Specialty Co., Don, Glendale, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mueller Brass Co., Port Huron, Mich.
Norwalk Valve Co., South Norwalk, Conn.
Powell Co., Wm., The, Cincinnati, O.
Research Vacuum Supply Co., Chicago, Ill.
Richmond Foundry & Mfg. Co., Inc., The, Richmond, Va.
Rockwell Co., W. S., Fairfield, Conn.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Security Valves Corp., Glendale, Calif.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trane Co., The, La Crosse, Wis.
United States Rubber Co., New York, N. Y.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, FIRE PROTECTION, SPRINKLER SYSTEM CONTROL

Allen Mfg. Co., W. D., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Coppus Engineering Corp., Worcester, Mass.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hersey Mfg. Co., South Boston, Mass.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Keckley Co., O. C., Skokie, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
McRae Specialty Co., Don, Glendale, Calif.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Security Valves Corp., Glendale, Calif.
Stockham Valves & Fittings, Birmingham, Ala.
Valco, Inc., Cincinnati, O.
Vernon Tool Co., Ltd., Alhambra, Calif.

VALVES, FLOAT

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis. (Oil)
Alco Valve Co., St. Louis, Mo.
American Hard Rubber Co., New York, N. Y. (Hard rubber)
American Moistening Co., Providence, R. I.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Boylston Steam Specialty Co., Chicago, Ill.
Cla-Val Co., Newport Beach, Calif.
Cleveland Humidifier Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Detroit Controls Corp., Detroit, Mich.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Frick Co., Waynesboro, Pa.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hubbell Corp., Mundelein, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Keckley Co., O. C., Skokie, Ill.
Ken-Ray Brass Corp., Vermont, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A.Y., Dubuque, Ia.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monash-Younker Co., Inc., Chicago, Ill.
Morey, Dan, Los Angeles, Calif.
Mueller Brass Co., Port Huron, Mich.
Multiplex Mfg. Co., Berwick, Pa.
OPW Corp., Cincinnati, O.
Phillips & Co., H. A., Chicago, Ill.
Robert Mfg. Co., Los Angeles, Calif.
Rockwell Co., W. S., Fairfield, Conn.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Shade Valve Mfg. Co., Philadelphia, Pa.
Schaub Engineering Co., Fred H., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scoville Mfg. Co., Waterville Div., Waterville, Conn.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Stickle Steam Specialties Co., Indianapolis, Ind.
Taco Heaters, Inc., Cranston, R. I.
Thermo-Mat Co., Los Angeles, Calif.
TOT Towers, Inc., Houston, Tex.
Trerice Co., H. O., Detroit, Mich.
Valves, Inc., F. G., Milwaukee, Wis.
Vanton Pump & Engineering Corp., Hillside, N. J. (plastic)
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.

VALVES, FLOW CONTROL, FOR HOT WATER HEATING SYSTEMS

American Flow Control Corp., Houston, Tex.
Automatic Switch Co., Orange, N. J.
Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Econo Products Company, Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Kates Co., W. A., Deerfield, Ill.
Kehm Corp., The, Chicago, Ill.
Leslie Co., Lyndhurst, N. J.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
OPW Corp., Cincinnati, O.
Quality Specialty Co., Inc., Camden, N. J.
Rockwell Co., W. S., Fairfield, Conn.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
White Flomatic Corp., Hoosick Falls, N. Y.

VALVES, FLUSH, BOTTOM TANK

Luzerne Rubber Co., Trenton, N. J. (hard rubber)
Powell Co., Wm., The, Cincinnati, O.

VALVES, FORGED STEEL

Alco Products, Inc., Schenectady, N. Y.
American Meter Co., Inc., Philadelphia, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Grove Valve and Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Smith Co., S. Morgan, York, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh.
Taylor Instrument Companies, Rochester, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, GATE, ALLOY

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Jenkins Bros., New York, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Milwaukee Valve Co., Milwaukee, Wis.
OPW Corp., Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, GATE, ALUMINUM

American Flow Control Corp., Houston, Tex.
Darling Valve & Mfg. Co., Williamsport, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Milwaukee Valve Co., Milwaukee, Wis.
OPW Corp., Cincinnati, O.
Powell Co., Wm., The, Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, GATE, BRASS AND BRONZE

American Brass Co., Waterbury, Conn.
Belknap Mfg. Co., Div. of Detroit Controls, Bridgeport, Conn.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Darling Valve Mfg. Co., Williamsport, Pa.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Fischer & Porter Co., Hatboro, Pa.
Hammond Brass Wks., Hammond, Ind.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Tin lined)
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockford Brass Works, Rockford, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Schaible Co., The, Mariemont, O.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, GATE, IRON BODY

Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Clow & Sons, Inc., James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Fischer & Porter Co., Hatboro, Pa.
Gas Machinery Co., Cleveland, O.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin lined)
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Scott Valve Mfg. Co., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Valve Div. of ACF Industries, Detroit, Mich.
Walworth Co., New York, N. Y.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, GATE, MALLEABLE IRON

Crane Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.

VALVES, GATE, STEEL

Alco Products, Inc., Schenectady, N. Y.
Allegheny Valve Co., Warren, Pa.
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Cameron Iron Works, Inc., Houston, Tex.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Edward Valves, Inc., East Chicago, Ind.
Everlasting Valve Co., Jersey City, N. J.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Greenwood Valve Div. of Vernon Tool Co., Ltd., Alhambra, Calif.
Grove Valve and Regulator Co., Oakland, Calif.
Hamer Valves, Inc., Long Beach, Calif.
Jenkins Bros., New York, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead lined)
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vernon Tool Co., Ltd., Alhambra, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
W-K-M Mfg. Co., Div. of ACF Industries, Inc., Houston, Tex.
Walworth Co., New York, N. Y.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, GLOBE, ALLOY

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Carpenter Valve Corp., The, Cleveland, O.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville,, Tenn.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Jenkins Bros., New York, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
LaBour Co., Inc., The, Elkhart, Ind.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Strahman Valves, Inc., New York, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, GLOBE, ALUMINUM

Dahl, G. W., Bristol, R. I.
Hasco Valve & Machine Co., Milwaukee.
Powell Co., Wm., The, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.

VALVES, GLOBE, BRASS AND BRONZE

American Brass Co., Waterbury, Conn.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Belknap Mfg. Co., Div. of Detroit Controls, Bridgeport, Conn.
California Brass Mfg. Co., Los Angeles.
Carpenter Sales Corp., Cleveland, O.
Carpenter Valve Corp., The, Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cleveland Brass Mfg. Co., The, Cleveland, O.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
Fairbanks Co., The, New York, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Wks., Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Rockford Brass Works, Rockford, Ill.
Schaible Co., The, Mariemont, O.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh.
Taylor Instrument Companies, Rochester, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco.
Walworth Co., New York, N. Y.
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, GLOBE, IRON BODY

Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Dersch, Gesswein & Neuert, Inc., Chicago.
Fairbanks Co., The, New York, N. Y.
Frick Co., Waynesboro, Pa.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hammel-Dahl Co., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.

Nason Co., Clarkston, Mich.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Walworth Co., New York, N. Y.

VALVES, GLOBE, MALLEABLE IRON

Automatic Switch Co., Orange, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Powell Co., Wm., The, Cincinnati, O.

VALVES, GLOBE, STEEL

Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
De Zurik Shower Co., Sartell, Minn.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Richmond Foundry & Mfg. Co., Inc., The, Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Shank Co., Cyrus, Chicago, Ill.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, INSTRUMENT

Associated Valve & Engineering Co., Chicago, Ill.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Autoclave Engineers Sales Corp., Erie, Pa.
Automatic Switch Co., Orange, N. J.
Bailey Co., Charles M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Carpenter Valve Corp., The, Cleveland, O.
Circle Seal Products Co., Inc., Pasadena, Calif.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Defender Instrument & Regulator Co., Boody, Ill.
Edward Valves, Inc., East Chicago, Ind.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Imperial Brass Mfg. Co., Chicago, Ill.
Keckley Co., O. C., Skokie, Ill.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
Republic Mfg. Co., Cleveland, O.
Roylyn, Inc., Glendale, Calif.
Security Valves Corp., Glendale, Calif.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Trerice Co., H. O., Detroit, Mich.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, LINED

American Flow Control Corp., Houston, Tex.
American Hard Rubber Co., New York, N. Y. (Rubber lined)
Automatic Switch Co., Orange, N. J.
Chemical Coatings & Engineering Co., Edgemont, Pa.
Cla-Val Co., Newport Beach, Calif.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Division Lead Co., Summit, Ill.
Fabri-Valve Co. of America, Portland, Ore.
Farris Flexible Valve Corp., Palisades Park, N. J.
Gates Engineering Co., Wilmington, Del.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Goodrich Co., B. F., Akron, O. (Rubber lined)
Goodrich Industrial Products Co., B. F., Akron, O.
Grinnell Co., Inc., Providence, R. I.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead lined)
National Lead Co., New York, N. Y. (Lead)
P-K Industries, Inc., North Arlington, N. J.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O. (plastic)
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (Lead)
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Saran Lined Pipe Co., Ferndale, Mich. (Saran lined)
Smith Co., S. Morgan, York, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
United States Rubber Co., New York, N. Y. (rubber lined, metal)

VALVES, MIXING, HOT AND COLD WATER

Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Dole Valve Co., The, Morton Grove, Ill.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
General Fittings Co., East Greenwich, R. I.
Hammel-Dahl Co., Providence, R. I.
Holby Tempering Valve Co., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
OPW Corp., Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
Radiant Utilities Corp., Brooklyn, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Strahman Valves, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Webster & Co., Warren, Camden, N. J.
Yula Water Heaters, Inc., Bronx, N. Y.

VALVES, MIXING, HOT AND COLD WATER, THERMOSTATIC

Controls Co. of America, Soreng Div., Schiller Park, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Fittings Co., East Greenwich, R. I.
Holby Tempering Valve Co., New York, N. Y.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Lawler Automatic Controls, Inc., Mt. Vernon, N. Y.
Leonard Valve Co., Cranston, R. I.
Powers Regulating Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Trerice Co., H. O., Detroit, Mich.
Vic Mfg. Co., Minneapolis, Minn.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Yula Water Heaters, Inc., Bronx, N. Y.

VALVES, MIXING, STEAM AND WATER

Hammel-Dahl Co., Providence, R. I.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
OPW Corp., Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Screw Machine Products Co., Portland, Ore.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Strahman Valves, Inc., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.

VALVES, MOTOR OPERATED

Alloy Steel Products Co., Linden, N. J. (stainless steel)
Associated Valve & Engineering Co., Chicago, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Belco Industrial Equipment Div., Bogue Electrical Mfg. Co., Paterson, N. J.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Clow & Sons, Inc., James B., Chicago, Ill.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
De Zurik Shower Co., Sartell, Minn.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy only)
Heat-Timer Corp., New York, N. Y.
Hills-McCanna Co., Chicago, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.

Homestead Valve Mfg. Co., Coraopolis, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Keckley Co., O. C., Skokie, Ill.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Mercoid Corp., Chicago, Ill.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
North American Mfg. Co., Cleveland, O.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Powell Co., Wm., The, Cincinnati, O.
Pratt Co., Henry, Chicago, Ill,
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Refrigerating Specialties Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Smith Co., S. Morgan, York, Pa.
Squires Co., C. E., The, Cleveland, O.
Stockham Valves & Fittings, Birmingham, Ala.
Taylor Instrument Companies, Rochester, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Warren Engineering Co., Broadway, N. J.
Webster & Co., Warren, Camden, N. J.
Wedgeplug Valve Co., Inc., Birmingham, Ala.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, NEEDLE

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
A-P Controls Div., Controls Corp. of America, Milwaukee, Wis. (Oil)
Allin Mfg. Co., Inc., Chicago, Ill.
Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Meter Co., Inc., Philadelphia, Pa.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Binks Mfg. Co., Chicago, Ill.
Carpenter Valve Corp., The, Cleveland, O. (Stainless steel stem, brass bar stock body)
Carpenter Sales Corp., Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Commonwealth Brass Corp., Detroit, Mich.
Cooper Alloy Corp., Hillside, N. J.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Detroit Controls Corp., Detroit, Mich.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Edward Valves, Inc., East Chicago, Ind.
Fairbanks Co., The, New York, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Jenkins Bros., New York, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Maid-O'-Mist, Inc., Chicago, Ill.
Madden Brass Products Co., Aurora, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Modern Engineering Co., St. Louis, Mo.
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
Mueller Brass Co., Port Huron, Mich.
Norgren Co., C. A., Englewood, Colo.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Security Valves Corp., Glendale, Calif.
Shank Co., Cyrus, Chicago, Ill.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Torit Mfg. Co., St. Paul, Minn.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, OXYGEN

Atkomatic Valve Co., Inc., Indianapolis, Ind.
Carpenter Valve Corp., The, Cleveland, O.
Dahl, G. W., Bristol, R. I.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Modern Engineering Co., St. Louis, Mo.
Ohio Injector Co., Wadsworth, O.
Oxygen Equipment & Service Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Roylyn, Inc., Glendale, Calif.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Valco, Inc., Cincinnati, O.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Inc., Birmingham, Ala.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, PILOT OPERATED

American Flow Control Corp., Houston, Tex.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Orange, N. J.
Bailey Co., Charles M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Clark Mfg. Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Farris Flexible Valve Corp., Palisades Park, N. J.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Hanna Engineering Works, Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
OPW Corp., Cincinnati, O.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Security Valves Corp., Glendale, Calif.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Stickle Steam Specialties Co., Indianapolis, Ind.

VALVES, PLASTIC

Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Agile Corp., Bedford, O.
American Flow Control Corp., Houston, Tex.
Atlas Mineral Products Co., Mertztown, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Colonial Plastics Mfg. Co., Cleveland, O. (Diaphragm valves)
Easton Plastic Products Co., Inc., Easton, Pa. (rigid, unplasticized polyvinyl chloride)
Goodrich Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Akron, O. (rigid)
Goodrich Industrial Products Co., B. F., Plastics Products, Marietta, O.
Hartwell & Son, Inc., H. N., Boston, Mass. (PVC)
Haveg Industries, Inc., Newark, Del.
Hills-McCanna Co., Chicago, Ill.
Industrial Plastic Fabricators, Inc., Norwood, Mass. (PVC)
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lunkenheimer Co., Cincinnati, O. (PVC)
Saran Lined Pipe Co., Ferndale, Mich, (saran)
Seelye Craftsman, Minneapolis, Minn.
Tube Turns Plastics Inc., Louisville, Ky. (PVC)
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., Hillside, N. J.
Walworth Co., New York, N. Y.

VALVES, PLUG

Alpha Plastics, Inc., Livingston, N. J. (PVC)
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
Ampco Metal, Inc., Milwaukee, Wis.
Andale Co., Philadelphia, Pa.
Barrett Haentjens & Co., Hazleton, Pa.
Bordo Co., Inc., L. J., Glenside, Pa.
California Brass Mfg. Co., Los Angeles, Calif.
Cameron Iron Works, Inc., Houston, Tex.
Circle Seal Products Co., Inc., Pasadena, Calif.
Clow & Sons, Inc., James B., Chicago, Ill.
Cooper Alloy Corp., Hillside, N. J.
Corning Glass Works, Corning, N. Y.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
De Zurik Shower Co., Sartell, Minn. (rubber faced)
Duriron Co., Inc., Dayton, O. (Acid resisting)
Faber Engineering Co., Inc., Philadelphia, Pa.
Fabri-Valve Co. of America, Portland, Ore.
Gato Valve Co., Pittsburgh, Pa.
General Ceramics Corp., Keasbey, N. J. (Chemical stoneware & porcelain)
Gilbert Brass Foundry Co., St. Louis, Mo.
Hamer Valves Inc., Long Beach, Calif.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloys)
Hays Mfg. Co., Erie, Pa.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Knight, Maurice A., Akron, O. (Stoneware for acids)
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)

Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Republic Mfg. Co., Cleveland, O.
Reynolds Shaffer Co., Detroit, Mich.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa. (lubricated)
Saran Lined Pipe Co., Ferndale, Mich. (Saran lined)
Smith Co., S. Morgan, York, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
Taylor Instrument Companies, Rochester, N. Y.
Texsteam Corp., Houston, Tex. (non-lubricated)
Thermac Co., Los Angeles, Calif.
Tube Turns Plastics, Inc., Louisville, Ky. (Injection molded PVC)
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vanton Pump & Equipment Corp., Hillside, N. J. (plastic)
Vogt Machine Co., Henry, Louisville, Ky.
W-K-M Mfg. Co., Div. of ACF Industries, Inc., Houston, Tex.
Walworth Co., New York, N. Y. (lubricated)
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Wedgeplug Valve Co., Inc., Birmingham, Ala.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, PRESSURE REDUCING AND PRESSURE RELIEF, WATER

(Including Provisions for Emergency Boiler Feeding)

Airmatic Valve, Inc., Cleveland, O.
American Flow Control Corp., Houston, Tex.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
Fischer & Porter Co., Hatboro, Pa.
Leslie Co., Lyndhurst, N. J.
Milton Roy Co., Philadelphia, Pa.
Squires Co., C. E., The, Cleveland, O.
Trerice Co., H. O., Detroit, Mich.
Valves, Inc., F. G., Milwaukee, Wis.
Watts Regulator Co., Lawrence, Mass.

VALVES, PRESSURE REDUCING AND REGULATING, AIR AND GAS

ACRC Div. of Hills-McCanna Co., Chicago, Ill.
A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
American Car & Foundry Div. of ACF Industries, Inc., New York.
American Flow Control Corp., Houston, Tex.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Autoclave Engineers Sales Corp., Erie, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Bryant Industrial Products Corp., Cleveland, O.
CCA Products, Inc., Glendale, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
DeVilbiss Co., The, Toledo, O.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Hanna Engineering Wks., Chicago, Ill.
Harris Calorific Co., The, Cleveland, O.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Liquid Carbonic Corp., The, Chicago, Ill.
Locke Regulator Co., Salem, Mass.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Maxitrol Co., Detroit, Mich.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Norgren Co., C. A., Englewood, Colo.
Norwalk Valve Co., South Norwalk, Conn.
OPW Corp., Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Powers Regulator Co., Skokie, Ill.
Refrigerating Specialties Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., Cleveland, O.
Strong, Carlisle & Hammond, Cleveland, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Tryco Products, Inc., Westfield, Mass.
Universal Controls Corp., Dallas, Tex.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, PRESSURE REDUCING AND REGULATING, HOT WATER

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Airmatic Valve Inc., Cleveland, O.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mueller Co., Decatur, Ill.
OPW Corp., Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Valves, Inc., F. G., Milwaukee, Wis.
Vapor Heating Corp., Chicago, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
White Flomatic Corp., Hoosick Falls, N. Y.

VALVES, PRESSURE REDUCING AND REGULATING, STEAM

Aerco Corp., Northvale, N. J.
Airmatic Valve, Inc., Cleveland, O.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., Boody, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dunham-Bush, Inc., West Hartford, Conn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis.

Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mueller Co., Decatur, Ill.
OPW Corp., Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, PUMP

Anchor Packing Co., Philadelphia, Pa.
Burrows Mfg. Co., F. A., York, Pa.
Cla-Val Co., Newport Beach, Calif.
Darcoid Co., Inc., New York, N. Y.
Defender Instrument & Regulator Co., Boody, Ill.
Durabla Mfg. Co., New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Garlock Packing Co., Palmyra, N. Y.
Goodrich Co., B. F., Akron, O.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jacuzzi Bros., Inc., Richmond, Calif.
Madden Corp., The, Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Myers & Bro. Co., F. E., The, Ashland, O.
New York Belting & Packing Co., Passaic, N. J.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Sims Pump Valve Co., Hoboken, N. J.
United States Rubber Company, New York, N. Y.
Valves, Inc., F. G., Milwaukee, Wis.
Watts Regulator Co., Lawrence, Mass.
Webster Electric Co., Racine, Wis.
Westinghouse Air Brake Div., Pittsburgh, Pa. (anti-surge)
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

VALVES, QUICK OPENING

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Flow Control Corp., Houston, Tex.
Barksdale Valves, Los Angeles, Calif.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Defender Instrument & Regulator Co., Boody, Ill.
Dole Refrigerating Co., Chicago, Ill.
Fairbanks Co., The, New York, N. Y.
Farris Flexible Valve Corp., Palisades Park, N. J.
Grinnell Co., Inc., Providence, R. I.
Hamer Valves, Inc., Long Beach, Calif.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Hasco Valve & Machine Co., Milwaukee. (alloy)
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McRae Specialty Co., Don, Glendale, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Nason Co., Clarkston, Mich.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R.K.L. Valve & Mfg. Co., Maple Shade, N. J.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Rockwood Sprinkler Co., Worcester, Mass.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Worcester Valve Co., Inc., Worcester, Mass.

VALVES, RADIATOR, AIR, FOR HOT WATER RADIATORS

Anderson Products, Inc., Cambridge, Mass.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Dole Valve Co., The, Morton Grove, Ill.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
G & H Mfg. Co., Philadelphia, Pa.
Hammond Brass Wks., Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Keeney Mfg. Co., Newington, Conn.
Little Brass Goods Co., M. S., Hartford, Conn.
Maid-O'Mist, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
New York Air Valve Corp., Brooklyn, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Quality Specialty Co., Inc., Camden, N. J.
Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.

VALVES, RADIATOR, AIR, FOR STEAM RADIATORS

Anderson Products, Inc., Cambridge, Mass.
Bridgeport Brass Co., Bridgeport, Conn.
Detroit Controls Corp., Detroit, Mich.
Dole Valve Co., The, Morton Grove, Ill.
Econo Products Co., Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Gorton Heating Co., Cranford, N. J.
Hammond Brass Wks., Hammond, Ind.
Heat-Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Keeney Mfg. Co., Newington, Conn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
New York Air Valve Corp., Brooklyn, N. Y.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, ELECTRIC

Barber-Colman Co., Rockford, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Jenkins Bros., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarcotherm Controls, Inc., New York, N. Y.
Vapor Heating Corp., Chicago, Ill.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, PACKLESS

Barber-Colman Co., Rockford, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, PNEUMATIC

Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF-CONTAINED

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E. The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trane Co., The, LaCrosse, Wis.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF-CONTAINED, PACKLESS

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.

VALVES, RADIATOR, ORIFICE

Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham-Bush, Inc., West Hartford, Conn.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Marsh Valve Co., Dunkirk, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Trane Co., The, LaCrosse, Wis.
Webster & Co., Warren, Camden, N. J.

VALVES, RADIATOR, STEAM AND HOT WATER, HAND

Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Dunham-Bush, Inc., West Hartford, Conn.
Fairbanks Co., The, New York, N. Y.
Haines Div., William S., Sellers Injector Corp., Philadelphia, Pa.
Hammond Brass Wks., Hammond, Ind.

Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Powell Co., Wm., The, Cincinnati, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trane Co., The, La Crosse, Wis.
Webster & Co., Warren, Camden, N. J.

VALVES, RADIATOR, STEAM AND HOT WATER, MODULATING

Barber-Colman Co., Rockford, Ill.
Barnes & Jones, Inc., Newtonville, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham-Bush, Inc., West Hartford, Conn.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Haines Div., William S., Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Ohio Brass Co., Mansfield, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling Inc., Milwaukee, Wis.
Webster & Co., Warren, Camden, N. Y.

VALVES, REFRIGERATION (ANGLE, CHECK, GATE, GLOBE, NEEDLE, RELIEF)

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
Hammel-Dahl Co., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Marsh Instrument Co., Skokie, Ill.
Mueller Brass Co., Port Huron, Mich.
Okadee Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, BACK PRESSURE

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
Mueller Brass Co., Port Huron, Mich.
Refrigerating Specialties Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.

VALVES, REFRIGERATION, EXPANSION, CONSTANT PRESSURE

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Cash Co., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
Lonergan Co., J. E., Philadelphia, Pa.
Mayson Mfg. Co., Detroit, Mich.
Refrigerating Specialties Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
Watkins Co., J. E., Maywood, Ill.

VALVES, REFRIGERATION, EXPANSION, THERMOSTATIC

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Detroit Controls Corp., Detroit, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Mayson Mfg. Co., Detroit, Mich.
Ranco, Inc., Columbus, O.
Sporlan Valve Co., St. Louis, Mo.
Tenney Engineering, Inc., Union, N. J.
X L Refrigerating Co., Chicago, Ill.

VALVES, REFRIGERATION, FLOAT, HIGH PRESSURE

Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Armstrong Machine Works, Three Rivers, Mich.
Foster Engineering Co., Union, N. J.
Frick Co., Waynesboro, Pa.
Hubbell Corp., Mundelein, Ill.
Mercoid Corp., Chicago, Ill.
Phillips & Co., H. A., Chicago, Ill.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, FLOAT, HIGH PRESSURE AND LOW PRESSURE

Mayson Mfg. Co., Detroit, Mich.
Phillips & Co., H. A., Chicago, Ill.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, LIQUID CONTROL, FLOAT PILOTED

Alco Valve Co., St. Louis, Mo.
Defender Instrument & Regulator Co., Boody, Ill.
Frick Co., Waynesboro, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Magnetrol, Inc., Chicago, Ill.
Phillips & Co., H. A., Chicago, Ill.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, REFRIGERATION, MAGNETIC STOP

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Orange, N. J.
Detroit Controls Corp, Detroit, Mich.
Frick Co., Waynesboro, Pa.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hubbell Corp., Mundelein, Ill.
Marsh Refrigeration Equipment Co., Affiliate Jas. P. Marsh Corp., Skokie, Ill.
Mercoid Corp., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.

VALVES, REFRIGERATION, TEMPERATURE REGULATING OR SNAP ACTION SUCTION

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
Hubbell Corp., Mundelein, Ill.
McCorkle Co., D. H., Berkeley, Calif.
Refrigerating Specialties Co., Chicago, Ill.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.

VALVES, REFRIGERATION, WATER REGULATING, PRESSURE OR TEMPERATURE ACTUATED

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Art Valve Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Foster Engineering Co., Union, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Kieley & Mueller, Inc., Middletown, N. Y.
Marsh Refrigeration Equipment Co., Affiliate Jas. P. Marsh Corp., Skokie, Ill.
Mayson Mfg. Co., Detroit, Mich.
Mercoid Corp., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Refrigerating Specialties Co., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Spence Engineering Co., Inc., Walden, N. Y.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

VALVES, RELIEF, HOT WATER, COMBINED PRESSURE AND TEMPERATURE OPERATED

Beaton & Cadwell Mfg. Co., New Britain, Conn.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Dole Valve Co., The, Morton Grove, Ill.
Foster Engineering Co., Union, N. J.
Kunkle Valve Co., Ft. Wayne, Ind.
McDonnell & Miller, Inc., Chicago, Ill.
Mueller Co., Decatur, Ill.
New York Air Valve Corp., Brooklyn, N. Y.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Schaible Co., The, Mariemont, O.
Thrush & Co., H. A. Peru, Ind.
Trane Co., The, La Crosse, Wis.
Watts Regulator Co., Lawrence, Mass.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED

Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Newport Beach, Calif.
Cochrane Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.

Dole Valve Co., The, Morton Grove, Ill.
Dunham-Bush, Inc., West Hartford, Conn.
Durabla Mfg. Co., New York, N. Y.
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Keckley Co., O. C., Skokie, Ill.
Kehm Corp., The, Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McAlear Mfg. Co., Chicago, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McDonnell & Miller, Inc., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Mueller Co., Decatur, Ill.
Multiplex Mfg. Co., Berwick, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Taco Heaters, Inc., Cranston, R. I.
Texsteam Corp., Houston, Tex.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Tryco Products, Inc., Westfield, Mass.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED, SELF-FILLING

Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
Mueller Co., Decatur, Ill.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

VALVES, RELIEF, HYDRAULIC

Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Charles M., San Francisco, Calif.
Blackhawk Mfg. Co., Milwaukee, Wis.
Cameron Iron Works, Inc., Houston, Tex.
Carpenter Valve Corp., The, Cleveland, O.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Commercial Shearing & Stamping Co., Youngstown, O.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Farris Engineering Corp., Palisades Park, N. J.
Foster Engineering Co., Union, N. J.
Fulflo Specialties Co., Inc., The, Blanchester, O.
General Controls Co., Glendale, Calif.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Keckley Co., O. C., Skokie, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonnell & Miller, Inc., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Pantex Mfg. Corp., Hydraulic Div., Pawtucket, R. I.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Republic Mfg. Co., Inc., Cleveland, O.
Ross Valve Mfg. Co., Troy, N. Y.
Scott Valve Mfg. Co., Detroit, Mich.
Trane Co., The, La Crosse, Wis.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Webster Electric Co., Racine, Wis.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.
Wilson Co., K. R., Arcade, N. Y.

VALVES, RELIEF, OIL

American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Circle Seal Products Co., Inc., Pasadena, Calif.
Cla-Val Co., Newport Beach, Calif.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Davis Regulator Corp., Chicago, Ill.
Durabla Mfg. Co., New York, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Greer Hydraulics, Inc., Jamaica, N. Y.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
Keckley Co., O. C., Skokie, Ill.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Kunkle Valve Co., Ft. Wayne, Ind.
Lancaster Heat Transfer Co., Inc., Brooklyn.
Locke Regulator Co., Salem, Mass.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milton Roy Co., Philadelphia, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia. (for oil handling)
Pantex Mfg. Corp., Hydraulics Div., Pawtucket, R. I.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Republic Mfg. Co., Cleveland, O.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Staples & Pfeiffer, San Francisco, Calif.
Texsteam Corp., Houston, Tex.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Watson & McDaniel Co., Philadelphia, Pa.
Webster Electric Co., Racine, Wis.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, SADDLE

Beckett & Co., Inc., Thomas, Dallas, Tex.
Darling Valve & Mfg. Co., Williamsport, Pa.
Fairbanks Co., The, New York, N. Y.
Imperial Brass Mfg. Co., Chicago, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Madden Brass Products Co., Aurora, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.

VALVES, SAFETY CLEANOUT

Petrometer Corp., Long Island City, N. Y.

VALVES, SAFETY, STEAM

American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Foster Engineering Co., Union, N. J.
Keckley Co., O. C., Skokie, Ill.
Kunkle Valve Co., Ft. Wayne, Ind.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McRae Specialty Co., Don, Glendale, Calif.
New York Air Valve Corp., Brooklyn, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Rockwood Sprinkler Co., Worcester, Mass.
Scott Valve Mfg. Co., Detroit, Mich.
Texsteam Corp., Houston, Tex.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vapor Heating Corp., Chicago, Ill.
Vernon Tool Co., Ltd., Alhambra, Calif.

VALVES, SLIDE

Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Fabri-Valve Co. of America, Portland, Ore.
General Ceramics Corp., Keasbey, N. J. (chemical stoneware)
General Controls Co., Glendale, Calif.
Jenkins Bros., New York, N. Y.
Ohio Injector Co., Wadsworth, O.
Rockwell Co., W. S., Fairfield, Conn.
Walworth Co., New York, N. Y.
Webster Electric Co., Racine, Wis.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, SOLDER JOINT

American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Cleveland Brass Mfg. Co., The, Cleveland, O.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Fairbanks Co., The, New York, N. Y.
Hammond Brass Works, Hammond, Ind.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York., N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Ohio Brass Co., Mansfield, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Valco, Inc., Cincinnati, O.
Walworth Co., New York, N. Y. (Silver brazed)

VALVES, SOLENOID

A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Airmatic Valve, Inc., Cleveland, O.
Alco Valve Co., St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Associated Valve & Engineering Co., Chicago, Ill.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Orange, N. J.

Barksdale Valves, Los Angeles, Calif.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.
Controls Co. of America, Soreng Div., Schiller Park, Ill.
Copes-Vulcan Div., Blaw-Knox Co., Erie, Pa.
Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Davis Regulator Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Dole Valve Co., The, Morton Grove, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Erickson Specialty Co., Cohoes, N. Y.
Farris Flexible Valve Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Gould Co., J. D., Indianapolis, Ind.
Grove Valve and Regulator Co., Oakland, Calif.
Hanna Engineering Wks., Chicago, Ill.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)
Hays Mfg. Co., Erie, Pa.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hubbell Corp., Mundelein, Ill.
Hunt & Son, Inc., C. B., Salem, O.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Johnson Corp., The, Three Rivers, Mich.
Keckley Co., O. C., Skokie, Ill.
Lammert & Mann Co., Chicago, Ill. (Gas safety shut-off)
Ledeen Mfg. Co., Los Angeles, Calif.
Locke Regulator Co., Salem, Mass.
Marsh Refrigeration Equipment Co., Affiliate Jas. P. Marsh Corp., Skokie, Ill.
Marsh Instrument Co., Skokie, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
McQuay-Norris Mfg. Co., St. Louis, Mo.
McRae Specialty Co., Don, Glendale, Calif.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penn Controls, Inc., Goshen, Ind.
Refrigerating Specialties Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Security Valves Corp., Glendale, Calif.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Squires Co., C. E., The, Cleveland, O.
Supreme Electric Products Corp., Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Union Electric & Mfg. Co., Jersey City, N. J.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Vapor Heating Corp., Chicago, Ill.
Watkins Co., J. E., Maywood, Ill.
Webster Electric Co., Racine, Wis.
White-Rodgers Co., St. Louis, Mo.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, STEAM-JACKETED

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Associated Valve & Engineering Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Everlasting Valve Co., Jersey City, N. J.
Farris Engineering Corp., Palisades Park, N. J.
Gato Valve Co., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)
Homestead Valve Mfg. Co., Coraopolis, Pa.
Parks-Cramer Co., Fitchburg, Mass.
Powell Co., Wm., The, Cincinnati, O.
Red Jacket Co., Inc., Carnegie, Pa.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Inc., Birmingham, Ala.

VALVES, 2, 3 AND 4 WAY

Airmatic Valve, Inc., Cleveland, O.
Alco Valve Co., St. Louis, Mo.
American Car & Foundry Div. of ACF Industries, Inc., New York, N. Y.
Aqua Matic, Inc., Rockford, Ill.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Barksdale Valves, Los Angeles, Calif.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Bordo Co., Inc., L. J., Glenside, Pa. (plug)
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Newport Beach, Calif.
Commercial Shearing & Stamping Co., Youngstown, O.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Davis Engineering Corp., Elizabeth, N. J.
Davis Regulator Co., Chicago, Ill.
Detroit Valve Co., Div. of Anderson Brass Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
De Zurik Shower Co., Sartell, Minn.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Hanna Engineering Wks., Chicago, Ill.
Henry Valve Co., Melrose Park, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Keller Tool Div. of Gardner-Denver Co., Grand Haven, Mich.
Kerotest Div., Miller Printing Machinery Corp., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Ledeen Mfg. Co., Los Angeles, Calif.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mueller Brass Co., Port Huron, Mich.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Ohio Brass Co., Mansfield, O.
Penn Controls, Inc., Goshen, Ind.
Permutit Co., New York, N. Y.
Powell Co., Wm., Cincinnati, O.
Republic Mfg. Co., Cleveland, O.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarcotherm Controls, Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemicals & Dye Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Wach Co., E. H., The, Chicago, Ill.
Walworth Co., New York, N. Y. (Lubricated plug valves)
Warren Engineering Co., Broadway, N. J.
Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Webster Electric Co., Racine, Wis.
Whittaker Co., Ltd., Wm. R., Los Angeles, Calif.

VALVES, WATER GAGE

Associated Valve & Engineering Co., Chicago, Ill.
Defender Instrument & Regulator Co., Boody, Ill.
Edward Valves, Inc., East Chicago, Ind.
Ernst Water Column & Gauge Co., Livingston, N. J.
Keckley Co., O. C., Skokie, Ill.
Longergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.

VANES, DUCT TURNING, PREFABRICATED

Anemostat Corp. of America, New York, N. Y. (Equalizing deflectors)
Barber-Colman Co., Rockford, Ill.
Duro-Dyne Corp., New Hyde Park, L. I. N. Y.
Elgen Mfg. Corp., Long Island City, N. Y.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Waterloo Register Co., Inc., Waterloo, Iowa

VAPOR BARRIERS

See Barriers, Vapor

VAPOR HEATING SYSTEMS

See Systems, Heating, Vapor

VAPORIZERS FOR PROPANE-BUTANE

Buxton Mfg. Co., Dover, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Mitchell Co., John E., Dallas, Tex.
Mutual Liquid Gas & Equipment Co., Gardena, Calif.
Ransome Co., Emeryville, Calif.

VARIABLE SPEED DRIVES

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical; Reducers, Speed; Pulleys and Sheaves, for Belt Drives

VARIABLE SPEED PULLEYS

See Changers, Speed, Mechanical

V-BELT DRIVES

See Drives, V-Belt

VELOCITY, REGULATORS

See Regulators, Air Velocity

VENT FLUE CAPS

See Caps, Vent Flue

VENTILATING HOSE

See Ducts and Duct Fittings, Prefabricated, Flexible, Metallic, and Non-Metallic

VENTILATION HEATERS

See Surface, Finned, Heating; Ventilators, Roof, Fan; Ventilators, Unit

VENTILATORS, MUSHROOM

Aladdin Heating Corp., San Leandro, Calif.
Atmos Corp., Chicago, Ill.
Burt Mfg. Co., Akron, O.
Carnes Corp., Verona, Wis.
Chicago Blower Corp., Franklin Park, Ill.
Cook Co., Loren, Berea, O.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Detroit Blower Corp., Franklin Park, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Knight, Maurice A., Akron, O. (Stoneware)
Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Martin Fan & Blower Co., Chicago, Ill.
Muckle Mfg. Co., Owatonna, Minn.
Peerless Electric Co., Warren, O.
Penn Ventilator Co., Philadelphia, Pa.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
University Fan & Blower Co., Berkeley, Calif.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.

VENTILATORS, ROOF, FAN

Acme Equipment Co., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Airjet Ventilator Co., San Clemente, Calif.
Air & Refrigeration Corp., New York, N. Y.
Aladdin Heating Corp., San Leandro, Calif.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Blower Corp., Detroit, Mich.
American Steel Band Co., Pittsburgh, Pa.
Ammerman Co., Inc., Minneapolis, Minn.
Arex Co., Chicago, Ill.
Atmos Corp., Chicago, Ill.
Bar-Brook Mfg. Co., Inc., Shreveport, La.
Bertram Co., Harvey P., The, Cincinnati, O.
Bishop & Babcock Mfg. Co., Cleveland, O.
Breidert Co., G. C., San Fernando, Calif.
Brookside Corp., McCordsville, Ind.
Burt Mfg. Co., Akron, O.
Carnes Corp., Verona, Wis.
Century Fan & Ventilator Co., Stamford, Conn.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Clay Equipment Corp., Cedar Falls, Ia.
Colt Ventilation Co. of America, Inc., Los Angeles, Calif.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
Dana Fan & Blower Corp., Cincinnati, O.
Davidson Hyduty Roof Fan Co., Newton, Mass.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Detroit Blower Corp., Franklin Park, Ill.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Gallaher Co., The, Omaha, Neb.
Gehri Co., Tacoma, Wash.
General Blower Co., Morton Grove, Ill.
Genie-Air, Los Angeles, Calif.
Hartzell Propeller Fan Co., Piqua, O.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Heating Assurance, Inc., Spokane, Wash.
Hill Co., Francis, Cleveland, O.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Hunter Div., Robbins & Myers, Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
International Engineering, Inc., Dayton, O.
Iona Ventilator Co., Inc., Philadelphia, Pa.
Iron Lung Ventilator Co., Cleveland, O.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
King Co. of Owatonna, The, Owatonna, Minn.
Kody Blower Co., Trenton, N. J.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Moore Co., The, Marceline, Mo.
Mountain States Equipment Co., Denver, Colo.
Muckle Mfg. Co., Owatonna, Minn.
New York Blower Co., Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Octagon Ventilator Co., Chicago, Ill.
Peerless Electric Co., Warren, O.
Penn Ventilator Co., Philadelphia, Pa.
Proctor & Schwartz, Inc., Philadelphia, Pa.
Propellair Div., Robbins & Myers Inc., Springfield, O.
Robertson Co., H. H., Pittsburgh, Pa.
Sargent Enginairing Co., Cleveland, O.
South Bend Air Products, Inc., South Bend, Ind.
Swartwout Co., The, Cleveland, O.
Trade-Wind Motorfans, Inc., Rivera, Calif.
Trane Co., The, La Crosse, Wis. (available with heating coils)
Tripar Products, Inc., Royal Oak, Mich.
Truflo Fan Co., Harmony, Pa.
University Fan & Blower Co., Berkeley, Calif.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.
Waverly Heating Supply Co., Boston, Mass.
Western Engineering & Mfg. Co., Venice, Calif.
Wind-Way Fan & Ventilator Co., New Orleans, La.
Wing Mfg. Co., L. J., Linden, N. J.

VENTILATORS, ROOF, GRAVITY

Accurate Sheet Metal & Mfg. Works, Chicago.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Airjet Ventilator Co., San Clemente, Calif.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Metal Works, Inc., New Orleans.
American Steel Band Co., Pittsburgh, Pa.
Ammerman Co., Inc., Minneapolis, Minn.
Arex Co., Chicago, Ill.
Atmos Corp., Chicago, Ill.
Breidert Co., G. C., San Fernando, Calif.
Brisk Metal Products, New York, N. Y.
Brookside Corp., McCordsville, Ind.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., Stamford, Conn.
Clay Equipment Corp., Cedar Falls, Ia.
Colt Ventilation Co. of America, Inc., Los Angeles, Calif.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Gehri Co., Tacoma, Wash.
Greenheck Bros. Mfg. Co., Schofield, Wis.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Inland Steel Products Co., Milwaukee, Wis.
International Metal Products, Phoenix, Ariz.
Iona Ventilator Co., Inc., Philadelphia, Pa.
Iwan Brothers, South Bend, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Klauer Mfg. Co., Dubuque, Ia.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Leslie Welding Co., Inc., Chicago, Ill.
Levow, David, New York, N. Y.
Moeschl-Edwards Corrugating Co., Inc., The, Cincinnati, O.
Octagon Ventilator Co., Chicago, Ill.
Penn Ventilator Co., Philadelphia, Pa.
Plasteel Products Corp., Washington, Pa.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Robertson Co., H. H., Pittsburgh, Pa.
St. Paul Corrugating Co., St. Paul, Minn.
Sioux Steel Co., Sioux Falls, S. D.
Souther Iron Co., E. E., St. Louis, Mo.
Swartwout Co., The, Cleveland, O.
Tierney Rotor Ventilator Co., Minneapolis, Minn.
University Fan & Blower Co., Berkeley, Calif.
Uno Ventilator Co., Malden, Mass.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.
Van Noorden Co., F., Boston, Mass.
Walker Jamar Co., Duluth, Minn.
Walker Mfg. & Sales Co., St. Joseph, Mo.
Warner Ventilator Co., La Grange, Ind.
Waverly Heating Supply Co., Boston, Mass.
Western Engineering & Mfg. Co., Venice, Calif.
Willis Steel Corp., Galesburg, Ill.

VENTILATORS, ROOF, WITH FUSIBLE LINKS, FOR VENTING PRODUCTS OF COMBUSTION

Airjet Ventilator Co., San Clemente, Calif.
American Metal Works, Inc., New Orleans, La.
Atmos Corp., Chicago, Ill.
Burt Mfg. Co., Akron, O.
Chicago Blower Corp., Franklin Park, Ill.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Detroit Blower Corp., Franklin Park, Ill.
Iona Ventilator Co., Inc., Philadelphia, Pa.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Kody Blower Co., Trenton, N. J.
Mahon Co., R. C., The, Detroit, Mich.
Propellair Div., Robbins & Myers, Inc., Springfield, O.
Swartwout Co., The, Cleveland, O.
University Fan & Blower Co., Berkeley, Calif.
Van Noorden Co., E., Boston, Mass.

VENTILATORS, UNIT

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Barnebey-Cheney Co., Columbus, O.
Blazer & Son, M., Passaic, N. J.
Brookside Corp., McCordsville, Ind.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Kody Blower Co., Trenton, N. J.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Nesbitt, Inc., John J., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O. (gas fired)
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Rittling Corp., The, Buffalo, N. Y.
Trane Co., The, LaCrosse, Wis.
United States Air Conditioning Corp., Philadelphia, Pa.
Vulcan Radiator Co., Hartford, Conn.
Wesix Electric Heater Co., San Francisco, Calif. (Electric)
Wood Mfg. Co., A. R., Luverne, Mich.

VIBRATION ISOLATORS

See Absorbers, Vibration; Bases and Pads, Vibration Isolating; Hose, Flexible, Metal and Fittings

VISCOSIMETERS

American Instrument Co., Inc., Silver Spring, Md.
Brabender Corp., Rochelle Park, N. J. (recording)
Bristol Co., The, Waterbury, Conn.
Brookfield Engineering Laboratories, Inc., Stoughton, Mass.
Drage Products, Inc., Union City, N. J.
Fischer & Porter Co., Hatboro, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Humboldt Mfg. Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Thomas Co., Arthur H., Philadelphia, Pa.
Thomas Industries, Inc., Electric Sprayit Div., Sheboygan, Wis.
Ultra-Viscoson Corp., The, Hartford, Conn.
Will Corp., Rochester, N. Y.

VISES, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Austin Corp., Robert, Boston, Mass.
Beaver Pipe Tools, Inc., Warren, O. (Sawing—for tubing)
Billings & Spencer Co., Hartford, Conn.
Capewell Mfg. Co., Hartford, Conn.
Columbian Vise & Mfg. Co., Cleveland, O.
Crown Die & Tool Corp., Chicago, Ill.
Desmond-Stephan Mfg. Co., Urbana, O.
Erie Tool Wks., Erie, Pa.
Hollands Mfg. Co., Erie, Pa.
Nye Tool Co., Chicago, Ill.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Springload Mfg. Corp., Seattle, Wash.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Vanderman Mfg. Co., Willimantic, Conn.
Western Wire Products Co., St. Louis, Mo.
Williams & Co., J. H., Buffalo, N. Y.
Yost Mfg. Co., Cambridge Springs, Pa.

VISES, SHEET METAL WORKERS'

Desmond-Stephan Mfg. Co., Urbana, O.
Milton Equipment Co., Philadelphia, Pa.
Yost Mfg. Co., Cambridge Springs, Pa.

WARM AIR FURNACES

See Furnaces, Warm Air

WASHERS, AIR

Air & Refrigeration Corp., New York, N. Y.
Air-Cooling Engineering Co., Evanston, Ill.
Air Fan Engineering Co., Los Angeles, Calif.
Alton Mfg. Co., Dallas, Tex.
American Blower Corp., Detroit, Mich.
Bahnson Co., Winston-Salem, N. C.
Bayley Blower Co., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.

Burdett Mfg. Co., Chicago, Ill.
Carrier Corp., Syracuse, N. Y.
Centri-Spray Corp., Livonia, Mich. (Wet type)
Century Engineering Corp., Cedar Rapids, Ia.
Clarage Fan Co., Kalamazoo, Mich.
Comfort Products Inc., Dallas, Tex.
Continental Air Filters, Inc., Louisville, Ky.
Donaldson Div., Marvin D. Shafer Co., Inc., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Ducon Co., The, Mineola, N. Y.
Johnson-March Corp., Philadelphia, Pa.
Mahon Co., R. C., The, Detroit, Mich.
Marlo Coil Co., St. Louis, Mo.
Master Fan Corp., Los Angeles, Calif.
Mountain States Equipment Co., Denver, Colo.
Parks-Cramer Co., Fitchburg, Mass.
Peters-Dalton, Inc., Detroit, Mich.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Schmieg Industries Inc., Detroit, Mich.
Schneible Co., Claude B., Detroit, Mich.
Silco Products, Inc., Minneapolis, Minn.
Spray Engineering Co., Somerville, Mass.
Surface Combustion Corp., Toledo, O.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.

WASHERS, FUME

Burdett Mfg. Co., Chicago, Ill.
Carrier Corp., Syracuse, N. Y.
Centri-Spray Corp., Livonia, Mich. (wet type)
Ducon Co., The, Mineola, N. Y.
General Ceramics Corp., Keasbey, N. J. (plastic & ceramic)
Hell Process Equipment Corp., Cleveland, O.
Johnson-March Corp., Philadelphia, Pa.
Knight Maurice A., Akron, Ohio (wet type)
Mahon Co., R. C., The, Detroit, Mich.
Master Fan Corp., Los Angeles, Calif.
Oxy Catalyst, Inc., Wayne, Pa.
Peabody Engineering Corp., New York, N. Y.
Schmieg Industries, Inc., Detroit, Mich.
Schneible Co., Claude B., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemicals & Dye Corp., New York, N. Y.

WATER CHILLERS

See Chillers, Water, for Air Conditioning and Refrigeration, Compressors, Refrigerating, Combined with Condenser, Water Chiller, Piping Connections, and Controls

WATER DISTRIBUTORS FOR CONDENSERS

See Distributors, Water, for Condensers

WATER HAMMER ELIMINATORS

See Absorbers, Shock, Liquid

WATER RAMS FOR CLEANING OUT PIPE LINES

See Rams, Water

WATER STERILIZER, ULTRAVIOLET

See Units, Sterilizing, Water

WATER TREATMENT

See Treatment, Water; Devices, Electrolytic, for Preventing Corrosion

WELD TESTING MACHINES

See Machines, Testing, Weld

WELDERS, ARC

Air Reduction Co., Inc., New York, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Borm Mfg. Co., Elgin, Ill.
Burdett Oxygen Co. of Calif., Huntington Park, Calif.
Electric Arc, Inc., Newark, N. J.
Ergolyte Mfg. Co., Philadelphia, Pa.
Eutectic Welding Alloys Corp., Flushing, N. Y.
Fern, Ralph, Scranton, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hammett Electric Mfg. Co., Kansas City, Mo.
Harnischfeger Corp., Milwaukee, Wis.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Hobart Bros. Co., Troy, O.
Kern Co., John A., Chicago, Ill.
Lee Co., K. O., Aberdeen, S. D.
Lincoln Electric Co., Cleveland, O.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y. (Inert gas-shielded)
Liquid Carbonic Corp., Chicago, Ill.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Metal & Thermit Corp., Rahway, N. J.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Electric Mfg. Co., Inc., Appleton, Wis.
National Cylinder Gas Co., Chicago, Ill.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Precision Welder Mfg. Co., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O.
Smith Corp., A. O., Milwaukee, Wis.
Smith Welding Equipment Corp., Minneapolis, Minn.
Trindl Products, Ltd., Chicago, Ill.
Tweco Products Inc., Wichita, Kan. (Cable connectors, electrode holders and accessories and welding cable)
United Specialties, Inc., El Dorado, Ark. (welding cable reel)
Welding Apparatus Co., Chicago, Ill.
Weldit, Inc., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.
Will-Weld Mfg. Co., Inc., Omaha, Neb.

WELDERS, FOR PLASTIC PIPE OR PLASTIC SHEET

American Agile Corp., Bedford, O.
Saran Lined Pipe Co., Ferndale, Mich. (electric & acetylene types)
Seelye Craftsman, Minneapolis, Minn.

WELDERS, SPOT

Acme Electric Welder Co., Los Angeles, Calif.
Acro Welder Mfg. Co., Milwaukee, Wis.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alphil Spot Welding Co., Brooklyn, N. Y.
Central Transformer Corp., Pine Bluff, Ark.
Delta Welder Corp., Detroit, Mich.
Duro-Dyne Corp., New Hyde Park, L. I. N. Y. (portable)
Eisler Engineering Co., Inc., Newark, N. J.
Fern, Ralph, Scranton, Pa.
Hammett Electric Mfg. Co., Kansas City, Mo.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y. (Inert gas-shielded arc)
Liquid Carbonic Corp., Chicago, Ill.
Mallory Co., P. R., The, Indianapolis, Ind. (electrode holders)
Micro Products Co., Chicago, Ill.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Electric Mfg. Co., Inc., Appleton, Wis.
Milton Equipment Co., Philadelphia, Pa.
National Cylinder Gas Co., Chicago, Ill.
Peer, Inc., Benton Harbor, Mich.
Research Vacuum Supply Co., Chicago, Ill.
Rex Welder Co., Kansas City, Mo.
Sciaky Bros., Inc., Chicago, Ill.
Taylor-Winfield Corp., Warren, O.
Thomson Electric Welder Co., Lynn, Mass.
Universal Welder Corp., Cleveland, O.
Weldex, Inc., Detroit, Mich.
Weldit, Inc., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.

WELDERS, STUD

Eisler Engineering Co., Inc., Newark, N. J.
Graham Manufacturing Co., Royal Oak, Mich.
Hammett Electric Mfg. Co., Kansas City, Mo.
KSM Products, Inc., Merchantville, N. J.
Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.

WELDING AND CUTTING APPARATUS, OXY-ACETYLENE

Air Reduction Co., Inc., New York, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Arcos Corp., Philadelphia, Pa. (arc-oxygen)
Atlas Welding Accessories Inc., Ferndale, Mich. (Weld cleaning tools)
Dockson Corp., Detroit, Mich.
Eutectic Welding Alloys Corp., Flushing, N. Y.
Evans Machine Co., Inc., Baltimore, Md.
General Scientific Equipment Co., Philadelphia, Pa.
Goss Gas, Inc., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
K-G Equipment Co., Allentown, Pa.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Liquid Carbonic Corp., The, Chicago, Ill.
Marquette Mfg. Co., Inc., Minneapolis, Minn.
Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas Co., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O. (portable and stationary acetylene generators)
Smith Welding Equipment Corp., Minneapolis, Minn.
United Specialties, Inc., El Dorado, Ark. (welding hose reel)
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.

WELDING COMPOUNDS

See Compounds, Welding

WELDING FUME COLLECTORS

See Exhausters, Welding Fume

WELLS, THERMOMETER

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Bristol Co., The, Waterbury, Conn.
Campbell Co., J. A., Long Beach, Calif.
Corning Glass Works, Corning, N. Y.
Engelhard, Inc., Charles, East Newark, N. J.
Foxboro Co., Foxboro, Mass.
General Ceramics Corp., Keasbey, N. J.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Pacific Transducer Corp., Los Angeles, Calif.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.

WHEELS, BLOWER

Advance Aluminum Castings Corp., Chicago.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Air Fan Engineering Co., Los Angeles, Calif.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co. Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brundage Co., The, Kalamazoo, Mich.
Burden Div., Torrington Mfg. Co., Los Angeles, Calif.
Carolina Blower Co., Inc., Greensboro, N. C.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Denbo Engineering & Sales Co., Inc., Indianapolis, Ind. (molded plastics)
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
Hastings Air Control, Inc., Omaha, Nebr.
Industrial Plastic Fabricators, Norwood, Mass. (PVC)
Jan-Air, Inc., Richmond, Ill.
Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago, Ill.
Master Fan Corp., Los Angeles, Calif.
Mayne Products Co., Dayton, O.
Moore Co., The, Marceline, Mo.
Morrison Products, Inc., Cleveland, O.
New York Blower Co., Chicago, Ill.
Palmer Mfg. Corp., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Revcor Inc., Carpentersville, Ill.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Torrington Mfg. Co., Torrington, Conn.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
United States Air Conditioning Corp., Philadelphia, Pa.
Utility Appliance Corp., Los Angeles, Calif.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.

Viking Air Products, Div. of National-U. S. Radiator Corp., Cleveland, O.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

WHITE PRINT MACHINES
See Machines, Blue Print and White Print

WINDOW PANELS FOR AIR CONDITIONERS
See Panels, Window, for Air Conditioners

WINDOW VENTILATOR AND FILTER UNITS
See Units, Window Ventilator and Filter

WINDOWS, HEAT INSULATING
Anderson Corp., Bayport, Minn.
Chamberlin Co. of America, Detroit, Mich.
Libbey-Owens-Ford Glass Co., Toledo, O.
Mississippi Glass Co., St. Louis, Mo.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Russell Co., F. C., The, Cleveland, O.
Southern Plastics Co., Columbia, S. C.

WIRE, ELECTRIC, NUMBERED, FOR CONTROL SYSTEMS
Bettcher Plastics Co., Portland, Ore. (skylight)
Chester Cable Corp., Chester, N. Y.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Essex Wire Corp., Ft. Wayne, Ind.
Gavitt Wire & Cable Co., Div. of American Hard Rubber Co., Brookfield, Mass.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Midwest Air Conditioning Co., Des Moines.
Midwest Automatic Control Co., Des Moines, Ia.
Phelps Dodge Copper Products Corp., New York, N. Y.
United States Rubber Co., New York, N. Y.
Westline Products Div. of Western Lithograph Co., Los Angeles, Calif.

WIRE, INSTRUMENT
Chester Cable Corp., Chester, N. Y.
Essex Wire Corp., Ft. Wayne, Ind.
Foxboro Co., Foxboro, Mass.
Gavitt Wire & Cable Co., Div. of American Hard Rubber Co., Brookfield, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Thermo Electric Co., Inc., Saddle Brook, N. J.
United States Rubber Co., New York, N. Y.

WIRE, OIL BURNER IGNITION
Chester Cable Corp., Chester, N. Y.
Dielectric Products Co., Inc., Jersey City, N. J.
Essex Wire Corp., Ft. Wayne, Ind.
Packard Electric Div., General Motors Corp., Warren, O.

Phelps Dodge Copper Products Corp., New York, N. Y.
United States Rubber Co., New York, N. Y.

WIRING, COMPLETE ASSEMBLIES, CUSTOM-MADE
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Chester Cable Corp., Chester, N. Y.
Cornish-Rutland Co., Williamstown, Mass.
Dielectric Products Co., Inc., Jersey City, N. J.
Essex Wire Corp., Ft. Wayne, Ind.
Gavitt Wire & Cable Co., Div. of American Hard Rubber Co., Brookfield, Mass.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Hammett Electric Mfg. Co., Kansas City, Mo.
Kulka Electric Mfg. Co., Inc., Mt. Vernon, N. Y.
Packard Electric Div., General Motors Corp., Warren, O.

WRAP, PIPE
Asbestos Asphalt Insulation Co., Chicago, Ill.
Canvas Products Co., St. Louis, Mo.
Johns-Manville, New York, N. Y.
L. O. F. Glass Fibers Co., Toledo, O.
Minnesota Mining & Mfg. Co., St. Paul.
Mortell Co., J. W., Kankakee, Ill.
Tapecoat Co., The, Evanston, Ill. (cool tar protective coating in tape form for pipe and fittings, insulated pipe underground and above ground.)

WRENCHES, CHAIN, PIPE
Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Nye Tool Co., Chicago, Ill.
Reed Mfg. Co., Erie, Pa.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.

WRENCHES, PIPE
American Machine Wks., Inc., Racine, Wis.
Armstrong Bros. Tool Co., Chicago, Ill.
Austin Corp., Robert, Boston, Mass.
Basford Co., H. R., San Francisco, Calif.
Billings & Spencer Co., Hartford, Conn.
Bonney Forge & Tool Works, Allentown, Pa.
Capewell Mfg., Hartford, Conn.
Erie Tool Works, Erie, Pa.
Frontier Bronze Corp., Niagara Falls, N. Y.
International Forge Co., Chicago, Ill. (aluminum)
Lowell Wrench Co., Worcester, Mass.
Lurie & Lurie, Chicago, Ill.
Nielsen, Inc., E. V., Stamford, Conn.
Nye Tool Co., Chicago, Ill.
Peck, Stow & Wilcox Co., Southington, Conn.
Proto Tools, Los Angeles, Calif.
Ridge Tool Co., Elyria, O.
Roddick Tool Co., Anaheim, Calif.
Sac Tool Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Talon Tools, Inc., North Arlington, N. J.
Tedd Company, The, Rockford, Ill.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Walworth Co., New York, N. Y.

WRENCHES, PIPE, REPLACEABLE JAW
Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Erie Tool Wks., Erie, Pa.
International Forge Co., Chicago, Ill.
Lurie & Lurie, Chicago, Ill.
Nye Tool Co., Chicago, Ill.
Proto Tools, Los Angeles, Calif.
Ridge Tool Co., Elyria, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Walworth Co., New York, N. Y.

WRENCHES, RATCHET
Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Bonney Forge & Tool Works, Allentown, Pa.
Duro Metal Products Co., Chicago, Ill.
Fairmount Tool & Forging, Inc., Cleveland, O.
Greene, Tweed & Co., North Wales, Pa.
Lowell Wrench Co., Worcester, Mass.
Lurie & Lurie, Chicago, Ill.
National Pipe Coatings, Inc., Huntington Park, Calif.
Proto Tools, Los Angeles, Calif.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Williams & Co., J. H., Buffalo, N. Y.
X-4 Corp., West Concord, Mass.

WRENCHES, TORQUE INDICATING
Ammco Tools, Inc., North Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Bonney Forge & Tool Works, Allentown, Pa.
Duro Metal Products Co., Chicago, Ill.
Fairmount Tool & Forging, Inc., Cleveland, O
JO-Line Tools, Inc., South Gate, Calif.
Kent-Moore Organization, Inc., Warren, Mich.
Portable Electric Tools, Inc., Chicago, Ill.
Proto Tools, Los Angeles, Calif.
Richmont, Inc., Monrovia, Calif.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp, Kenosha, Wis.
Sturtevant Co., P. A., Addison, Ill.
Williams & Co., J. H., Buffalo, N. Y.
Wilson Co., K. R., Arcade, N. Y.

X-RAY MACHINES AND FILM
See Machines and Film, X-Ray

ZONE CONTROLS
See Systems, Heating, Zone Control

DIRECTORY SECTION
HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRIAL AND ALL OTHER LARGE BUILDINGS

PART 3—ALL TRADE NAMES

A-3, Desterge—Cleaning compounds. Airkem, Inc., New York, N. Y.

A-B—Motor controllers, regulators, relays, solenoids, switches, valves. Allen-Bradley Co., Milwaukee, Wis.

ABC—Dehumidifiers, humidifiers, dust collectors. American Blower Corp., Detroit, Mich.

ABR-A-Saw—Cutters, tools. Collins Machinery Corp., Los Angeles, Calif.

A-C—Water treatment. Elgin Softener Corp., Elgin, Ill.

ACB—Coatings. Tropical Paint & Oil Co., Cleveland, O.

A/C Range—Filters. American Air Filter Co., Inc., Louisville, Ky.

AECR—Air Conditioning units. Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U.S. Radiator Corp., Johnstown, Pa.

A & R—Dehumidifiers. Air & Refrigeration Corp., New York, N. Y.

AISI Automatic Smoke Sampler—Testers, smoke. Research Appliance Co., Allison Park, Pa.

ARR 300#—Unions. Jefferson Union Co., New York, N. Y.

ARRC—Couplings, fittings, flanges, unions. Union Metal Wks. Co., Inc., Chelsea, Mass.

ASME—Regulators. Bell & Gossett Co., Morton Grove, Ill.

Abrasoweld—Electrodes. Lincoln Electric Co., Cleveland, O.

Absolute—Air filters. Cambridge Filter Corp., Syracuse, N. Y.

Ace—Dampers. Marsto Machine Co., West Quincy, Mass.

Ace—Fittings, pipe, protective coatings, pumps, tanks, valve. American Hard Rubber Co., New York, N. Y.

Ace-Flex—Plastic tubing. American Hard Rubber Co., New York, N. Y.

Ace-Ite—Plastic pipe. American Hard Rubber Co., New York, N. Y.

Ace-Saran—Plastic tubing. American Hard Rubber Co., New York, N. Y.

Acipco—Steel tubing. American Cast Iron Pipe Co., Birmingham, Ala.

Acolite—Enamels and lacquers. Acorn Paint and Chemical Co., Cleveland, O.

Acoustilite—Insulation. Insulite Div. Minnesota & Ontario Paper Co., Minneapolis, Minn.

Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Acro—Gages, regulators. ACRC Div. of Hills-McCanna Co., Chicago, Ill.

Acrowrap—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.

Actex—Heat exchangers. Wabash Corp., Chicago, Ill.

Actrol—Valves. Milwaukee Gas Specialty Co., Milwaukee, Wis.

Adacast—Refractories. Botfield Refractories Co., Philadelphia, Pa.

Adamant—Furnace cement, refractories and refractory cement. Botfield Refractories Co., Philadelphia, Pa.

Adapatch—Refractories. Botfield Refractories Co., Philadelphia, Pa.

Adastic—Insulating cement, insulation. Botfield Refractories Co., Philadelphia, Pa.

Adjusta-Flo—Valves. Sullivan Valve & Engineering Co., Butte, Mont.

Adjusto—Racks. Haertel Co., Walter, Minneapolis, Minn.

Adjust-O-Feeder—Feeders, pumps, water treatment. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Adjust-O-Slide—Motor bases. American Pulley Co., The, Philadelphia, Pa.

Adjustor—Heating systems, elbows. The Kehm Corp., Chicago, Ill.

Adsco—Convertors, coolers, preheaters, regulators, exchangers, heaters, joints, pipe hangers and supports, separators, sight glasses, strainers. American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.

Adsco Corruflex—Pipe joints. American District Steam Div., ADSCO Industries, Inc., Buffalo, N. Y.

Adsorbit—Air freshening compounds. Barnebey-Cheney Co., Columbus, O.

Advance—Scaffolds. Beaver Advance Corp., Ellwood City, Pa.

Aeracool—Blades, fans. Myers Electric Co., Inc., Pittsburgh, Pa.

Aerisweld—Electrodes. Lincoln Electric Co., Cleveland, O.

Aero—Aftercoolers, heat exchangers. Niagara Blower Co., New York, N. Y.

Aero—Radiation, hangers or brackets. National-U. S. Radiator Corp., The, Johnstown, Pa.

Aerodyne—Fans, ventilators. Jeffrey Mfg. Co., Columbus, O.

Aerodyne—Collectors. Green Fuel Economizer Co., Beacon, N. Y.

Aerofuse—Air diffusers. Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.

Aeromaster—Propeller fans, blades. Koppers Company, Inc., Metal Products Div., Baltimore, Md.

Aeromatic Exhauster—Ventilators. Octagon Ventilator Co., Chicago, Ill.

Aeropass—Condensers. Niagara Blower Co., New York, N. Y.

Aeropel—Ventilators. American Blower Corp., Detroit, Mich.

Aeroplane—Roof ventilators. Jordan & Co., Inc., Paul R., Indianapolis, Ind.

Aeroplex—Fans. Bayley Blower Co., Milwaukee, Wis.

Aeropull—Roof ventilators. Jordan & Co., Inc., Paul R., Indianapolis, Ind.

Aerosolve—Air filters. Cambridge Filter Corp., Syracuse, N. Y.

Aerospot—Fans. South Bend Air Products, Inc., South Bend, Ind.

Aeroturn—Collectors. Koppers Co., Inc., Metal Products Div., Baltimore, Md.

Aerovane—Anemometers. Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.

Aerovane—Grilles, registers. Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.

Aertite—Boiler & tànk insulation, compounds. Johns-Manville, New York, N. Y.

Aerulux—Air conditioning units. Johnson Co., S. T., Oakland, Calif.

Afco—Heaters, air conditioning units. American Furnace Co., St. Louis, Mo.

Affco—Louvers and shutters. American Foundry & Furnace Co., Bloomington, Ill.

Agastat—Electrical relays. A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J.

Agaswitch—Time switches. A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J.

Agilene—Fittings, fans, sheets, ducts and duct fittings, pipe, tubing, welders, valves. American Agile Corp., Bedford, O.

Agilide—Ducts and duct fittings, fans, sheets, pipe, welders, valves. American Agile Corp., Bedford, O.

Agitair—Air diffusers, filters, meters, ventilators. Air Devices, Inc., New York.

Airacoustic—Insulation. Johns-Manville, New York, N. Y.

Air-aid—Compounds. Lord & Clark Co., Inc., Boston, Mass.

Air Cell—Asbestos insulation. Keasbey & Mattison Co., Ambler, Pa.

Aircell Board—Insulation, Sheets. Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.

Airco—Arc welders, electrodes, weld testing, welding rod, solder, machines, torches. Air Reduction Co., Inc., New York, N. Y.

Aircon—Condensers. McQuay, Inc., Minneapolis, Minn.

Air-Con—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Aircoustat—Duct insulation. Koppers Co., Inc., Metal Products Div., Baltimore, Md.

Aircoustat—Duct insulation. Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.

Airditioner—Air conditioning units. Modine Mfg. Co., Racine, Wis.

Airefiner—Water treatment. Oakite Products, Inc., New York, N. Y.

AIRefrigeration—Air conditioning units. Williamson Co., Cincinnati, O.

Aire-Rectifier—Coolers, air conditioning units. Lintern Corp., Painesville, O.

Airette—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.

Airex—Air washers, fans, unit air conditioners, ventilators. Mountain States Equipment Co., Denver, Colo.

Airflex—Couplings. Falk Corp., Milwaukee.

Air-flo—Louvers and shutters. Air Conditioning Products Co., Detroit, Mich.

Airflow Control—Fume disposal hoods. Kewaunee Mfg. Co., Adrian, Mich.

Airfoil—Fans, fan blades, ventilators. Aerovent Fan Co., Inc., Piqua, O.

Airfoil—Registers, scoops, grilles, dampers, diffusers. Titus Mfg. Corp., Waterloo, Ia.

Air Guide—Vanes. Titus Mfg. Corp., Waterloo, Ia.

Air Guide—Radiation. Rempe Co., Chicago.

Airion—Ionization apparatus, sterilizing units. Dryomatic Corp., Alexandria, Va.

Airistocrat—Fan blades. Torrington Mfg. Co., Torrington, Conn.

Airistocrat—Fan blades, propeller fans. Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.

Airjector—Ventilators. Swartwout Co., Cleveland, O.

Air Kits—Blower wheels. New York Blower Co., Chicago, Ill.

Airlift—Ventilators. Swartwout Co., Cleveland, O.

Air Line—Motors. Brown-Brockmeyer Co., Inc., Dayton, O.

Airline-Norge Heat—Heaters, air conditioning units. Ingersoll Conditioned Air Div., Borg-Warner Corp., Kalamazoo, Mich.

Airliner—Fan blades, and fans. Burden Co., Alan E., Los Angeles, Calif.

Airlouver—Louvers and shutters. Swartwout Co., Cleveland, O.

Air Master—Diffusers, grilles, registers. Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.

Airmaster—Dehumidifiers. Haertel Co., Walter, Minneapolis, Minn.

Air Mat-PC—Filters. American Air Filter Co., Inc., Louisville, Ky.

Airmat Arrester—Dust collectors. American Air Filter Co., Inc., Louisville, Ky.

Airmat Drifilter—Filters. Airgard Mfg. Co. Chicago, Ill.

Air-Max—Dampers, diffusers, fans, unit heaters, ventilators. Gallaher Co., The, Omaha, Neb.

Air Meter—Air velocity meters. Hastings-Raydist, Inc., Hampton, Va.

Air Mist—Chillers. Coleman Co., Inc., The, Wichita, Kans.

Air Motor Valves—Valves. General Controls Co., Glendale, Calif.

Airmover—Ventilators. Swartwout Co., Cleveland, O.

Airocool—Burners. National Airoil Burner Co., Inc., Philadelphia, Pa.

Airo-Flex—Registers. Auer Register Co., Cleveland, O.

Airoil—Oil burners. National Airoil Burner Co., Inc., Philadelphia, Pa.

Air-O-Matic—Air conditioning units. Williams Div., Eureka Williams Corp., Bloomington, Ill.

Air-O-Rator—Units, window ventilator and filter. Goodwill Mfg. Co., Chicago, Ill.

Airotor—Blower wheels. Torrington Mfg. Co., Torrington, Conn.

Airotor—Propeller fans. Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.

Airovent—Gas Burners. National Airoil Burner Co., Inc., Philadelphia, Pa.

Airpak—Filters. Conoflow Corp., Subsidiary of Walworth Co., Philadelphia.

Airphlo Vent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.

Air Prover—Regulators. A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.

Air Pure—Air filters. Flanders Mill, Inc., Riverhead, Long Island, N. Y.

Air Rad—Radiation, heating systems. Penn Boiler & Burner Corp., Lancaster, Pa.

Airsan—Filters. Air Filter Corp., Milwaukee.

Air-Scoop—Eliminators, air separators. Taco Heaters, Inc. Cranston, R. I.

Airstat—Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Airswitch—Thermostats, regulators. Minneapolis-Honeywell Regulator Co., Minneapolis.

Air-Trim Baseboard—Diffusers. Vulcan Radiator Co., Hartford, Conn.

Airtrol—Air eliminators. Bell & Gossett Co., Morton Grove, Ill.

Airtron—Ducts and duct fittings, hose. Arrowhead Rubber Co., Long Beach, Calif.

Air-Tumbler—Dust collectors. Dust Suppression & Engineering Co., Lake Orion, Mich.

Air-Van—Ventilators, exhausters, fans. Gallaher Co., The, Omaha, Neb.

Air-Wave—Fans. Trade-Wind Motorfans, Inc., Los Angeles, Calif.

Air-X-it—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.

Airxpel—Traps. Wright-Austin Co., Detroit.

Airxpeler—Roof ventilators, dampers, fittings, hose, exhausters, fans, louvers and shutters, vent flue caps. Ammerman Co., Inc., Minneapolis, Minn.

Ajax—Gaskets. United States Gasket Co., Camden, N. J.

Akon—Water treatment. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Aktiv—Cleaning compounds. Turco Products, Inc., Los Angeles, Calif.

Alaskan—Fans, air conditioning units. National Engrg. & Mfg. Co., Sedalia, Mo.

Alathon—Plastics, powders and resins. duPont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.

Alcoa—Angles, compounds, rods, dehydrators, exchangers, pipe, sheets, tanks, tubing. Aluminum Co. of America, Pittsburgh, Pa.

Alcoplate—Pipe. Alco Products, Inc., Schenectady, N. Y.

Alcotwin—Exchangers. Alco Products, Inc., Schenectady, N. Y.

Alcuplate—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Alfol—Insulation. Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.

Algaecide—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.

Algicide—Water treatment. North American Mogul Products Co., The, Cleveland, O.

Aliron—Sheets, clad. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Alkaline—Compounds. Turco Products, Inc., Los Angeles, Calif.

Alkasteem—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.

Alkyd—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.

All-Chem—Rotary pumps. Eco Engineering Co., Newark, N. J.

Allen—Benders. Steel City Electric Co., Pittsburgh, Pa.

Allencote—Refractories and refractory cement. Allen Co., Robert G., Mechanicsville, N. Y.

Allenite—Soot destroyers. Allen Co., Robert G., Mechanicsville, N. Y.

All-In-One—Regulators. Bell & Gossett Co., Morton Grove, Ill.

All-Motor—Gear-motors. Falk Corp., Milwaukee, Wis.

Allmul—Refractories and refractory cement. Babcock & Wilcox Co., Boiler Div., New York, N. Y.

Allprene—Gaskets. Chicago Gasket Co., Chicago, Ill.

All Purpose—Grilles. Louvra Mfg. & Sales Co., Union, N. J.

Allspeed Selector—Mechanical changers. Worthington Corp., Harrison, N. J.

Alltemp—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.

All-Tite—Vanes. Elgen Mfg. Corp., Long Island City, N. Y.

Allumatic—Heaters. Hotstream Heater Co., Cleveland, O.

All-Weather Thinline—Air conditioning units. General Electric Co., Appliance & Television Receiver Div., Louisville, Ky.

Alnifer—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Alnor—Anemometers, indicator controllers, thermometers. Illinois Testing Laboratories, Inc., Chicago, Ill.

Alodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.

Aloyco—Gages, valves. Alloy Steel Products Co., Linden, N. J.

Alpine—Air conditioning units. International Metal Products Co., Phoenix, Ariz.

Alsiplate—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Alternarc—Arc welders. Electric Arc, Inc., Newark, N. J.

Alumalung—Roof ventilators. Iron Lung Ventilator Co., Cleveland, O.

Alumilux—Heaters. Clayton & Lambert Mfg. Co., Louisville, Ky.

ALUMINIZED—Sheets, aluminum coated. Armco Steel Corp., Middletown, O.

Aluminum—Roof ventilators. Iron Lung Ventilator Co., Cleveland, O.

Aluminweld—Electrodes. Lincoln Electric Co., Cleveland, O.

Alumnaweld—Solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.

A-Lum-O-Aire—Filters. Aluminum Wool Div., Carey Electronic Engineering Co., Springfield, O.

A-Lum-O-Aire—Filters. Carey Electronic Engineering Co., Metal Wool Div., Springfield, O.

Alundum—Cement, grinders and grinding wheels, refractories and refractory cement. Norton Co., Worcester, Mass.

AluTin—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.

Amblerex#2—Insulating cement. Keasbey & Mattison Co., Ambler, Pa.

Amco—Protective coatings, welding compounds, solder. American Solder & Flux Co., Philadelphia, Pa.

Amco—Humidifiers, psychrometers. Grinnell Co., Inc., Providence, R. I.

Amco—Control Systems, humidifiers, hygrometers, indicators, meters, nozzles, air conditioning units, psychrometers, valves. American Moistening Co., Providence, R. I.

Amcoil—Cooling units. American Coils Co., Newark, N. J.

Amer-Clone—Collectors. American Air Filter Co., Inc., Louisville, Ky.

Amer-glas—Air filters. Bowman Co., D. F., New Albany, Ind.

Amer-glas—Unit filters. American Air Filter Co., Inc., Louisville, Ky.

American—Recorders, manometers, regulators, thermometers, transmitters, wells. Manning, Maxwell & Moore, Inc., Stratford, Conn.

American—Meters. Buffalo Meter Co., Buffalo, N. Y.

American—Heater. Hotstream Heater Co., Cleveland, O.

American Hammered—Rings. Koppers Company, Inc., Metal Products Div., Baltimore.

American H/V—Unit Filters. American Air Filter Co., Inc., Louisville, Ky.

American-Microsen — Transmitters. Manning, Maxwell & Moore, Inc., Stratford, Conn.

Amerigear—Couplings. American Flexible Coupling Div., Zurn Industries, Inc., Erie, Pa.

Ameritherm—Heaters, air conditioning units. American Thermal Industries, Inc., Detroit.

Amerjet—Collectors. American Air Filter Co., Inc., Louisville, Ky.

Amer-Plate—Tank linings. Amercoat Corp., South Gate, Calif.

Ames—Pumps. Domestic Pump & Mfg. Corp., Shippensburg, Pa.

Amesteam—Boilers. Ames Iron Works, Inc., Oswego, N. Y.

Aminco—Colorimeters, gage testers, indicator-controllers, indicators, pumps, recorders, regulators, recorder-controllers, relays, viscosimeters. American Instrument Co., Inc., Silver Spring, Md.

Ammonoduct—Pipe. Bethlehem Steel Co., Bethlehem, Pa.

Ampcoflex—Pipe fittings, fume disposal hoods, plastic valves, tanks, ducts and duct fittings, plastic pipe, plastic sheets. Atlas Mineral Products Co., Mertztown, Pa.

Ampcolite—Pipe fittings, plastic pipe. Atlas Mineral Products Co., Mertztown, Pa.

Am-Pe-Co—Centrifugal fans. American Machine Products Co., Marshalltown, Ia.

Amphesive—Adhesives. Atlas Mineral Products Co., Mertztown, Pa.

Amtico—Heaters, air conditioning units. American Thermal Industries, Inc., Detroit.

Anaconda—Angles, bars, beams, channels and tees, electrodes, fittings, pipe, welding rod, sheets, tubing, valves. American Brass Co., Waterbury, Conn.

Anco—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.

Anco Condenser Cleaner—Compounds, scale removal. Anderson Chemical Co., Inc., Macon, Ga.

Andrite—Dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.

Anemotherm—Direct reading meters. Anemostat Corp. of America, New York, N. Y.

Ankorite—Packing. Anchor Packing Co., Philadelphia, Pa.

Anti-Capillary—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.

Anti-Spatter—Welding compounds. Thompson and Co., Oakmont, Pa.

Anti-Spatter—Welding compounds. Wolfe-Kote Co., Inc., Sheboygan, Wis.

Apco—Turbine type pumps, systems. Aurora Pump Div., The New York Air Brake Co., Aurora, Ill.

Apeco—Blueprint machines. American Photocopy Equipment Co., Chicago, Ill.

Apex—Analyzers, recorders, indicators. Uehling Instrument Co., Paterson, N. J.

Apexior—Coatings. Dampney Co. of America, Boston, Mass.

Aprilaire—Humidifiers. Research Products Corp., Madison, Wis.

Apsco—Switches. April Showers Co., Inc., Washington, D. C.

Apthorp—Nozzles. Boston Machine Works, Inc., Lynn, Mass.

Aqua-Clear—Water treatment. Sudbury Laboratory, South Sudbury, Mass.

Aquacooler—Towers, cooling. The Marley Co., Kansas City, Mo.

Aqualator—Circulators. Triplex Heating Specialty Co., Inc., Peru, Ind.

Aqua-Line—Radiation. York-Shipley, Inc., York, Pa.

Aqua-Saver—Cooling towers. Peerless Products Div., United Cooling Towers, Inc., N. Little Rock, Ark.

Aqua-Sorb—Dehumidifiers. Abbeon Supply Co., Jamaica, N. Y.

Aquastat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Aqua-Tite—Seals. Schwitzer Corp., Indianapolis, Ind.

Aquatone—Treatment, compounds, steam and water. Ampion Corp., Long Island City, N. Y.

Aquatower—Cooling towers. Marley Co., The, Kansas City, Mo.

Aqulux—Water heaters. Johnson Co., S. T., Oakland, Calif.

Arbest—Flanges, hangers, humidifiers, nipples, plates, valves. G & H Mfg. Co., Philadelphia, Pa.

Arcaloy—Electrodes. Alloy Rods Co., York, Pa.

Arc-Eng—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Arco—Hangers, radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Arcoliner—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Arco Sil—Hose, ducts and duct fittings. Arrowhead Rubber Co., Long Beach, Calif.

Arctic Circle—Air conditioning units. International Metal Products Co., Phoenix, Ariz.

Arex-Austor—Roof ventilators. Arex Co., Chicago, Ill.

Arid Air—Dehumidifiers. Tamms Industries, Inc., Chicago, Ill.

Arin—Louvers and shutters. Arex Co., Chicago, Ill.

Armalite—Insulation. Armstrong Cork Co., Lancaster, Pa.

Armaloy—Wrenches. Armstrong Bros. Tool Co., Chicago, Ill.

Ar-Met—Meters. Brooks Rotameter Co., Lansdale, Pa.

Armstrong-Bridgeport—Chasers, cutters, pipe cutting oil, reamers, stands, stocks and dies, tools, vises, and wrenches. Capewell Mfg. Co., Hartford, Conn.

Aroclor—Heat transfer oil. Monsanto Chemical Co., St. Louis, Mo.

Arrowtrol—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Art—Direct radiation, hangers or brackets. The National-U. S. Radiator Corp., Johnstown, Pa.

Artic—Refrigerant. E. I. du Pont de Nemours & Co., Electrochemical Dept., Wilmington, Del.

Asbestocel—Boiler, tank & pipe insulation. Johns-Manville, New York, N. Y.

Asbestocite—Boiler & tank insulation. Johns-Manville, New York, N. Y.

Asbestolux—Insulation. North American Asbestos Corp., Chicago, Ill.

Asco—Valves, relays, solenoid and solenoid cells, strainers, switches, panel and control boards. Automatic Switch Co., Orange, N. J.

Ashcroft—Gages, cocks, recorders, switches, valves, testers, transmitters. Manning, Maxwell & Moore, Inc., Stratford, Conn.

Aspir-Jet—Nozzles. Thermal Agency, Houston, Tex.

At-a-Glance—Gages. Krueger Sentry Gauge Co., Green Bay, Wis.

Athol Unions—Fittings, unions. Leavitt Machine Co., Orange, Mass.

Atlas—Diffusers, grilles, registers. J. B. Smith Co., Philadelphia, Pa.

Atlas—Fans, furnaces, heaters. Tuck-Aire Furnace Co., San Francisco, Calif.

Atlastaflex—Tank linings. Atlas Mineral Products Co., Mertztown, Pa.

Atlastaply—Tank linings. Atlas Mineral Products Co., Mertztown, Pa.

Atlastavon—Tank linings, tanks. Atlas Mineral Products Co., Mertztown, Pa.

Atlastic 77—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.

Atlastiseal—Tank linings. Atlas Mineral Products Co., Mertztown, Pa.

Atmos-Therm—Condensers. Rempe Co., Chicago, Ill.

Atom-Arc—Electrodes. Alloy Rods Co., York, Pa.

Atometer—Meters. American Moistening Co., Providence, R. I.

Atomick—Humidifiers, nozzles. Maid-O'-Mist, Inc., Chicago, Ill.

Auto-Airman—Air filters. American Air Filter Co., Inc., Louisville, Ky.

Auto-Klean—Filters, strainers. Cuno Engineering Corp., Meriden, Conn.

Autolite—Motors, wire, recorders, thermometers. Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.

Autolube—Bearings. International Powder Metallurgy, Inc., Ridgway, Pa.

Automaze—Filters. Air-Maze Corp., Cleveland, O.

Auto-Stat—Blue and white print machines. American Photocopy Equipment Co., Chicago, Ill.

Auto-Vent—Eliminators, humidifiers, valves. Maid-O'-Mist, Inc., Chicago, Ill.

Autronic—Recorders, indicator-controllers, meters, recorder-controllers, regulators. Swartwout Co., Cleveland, O.

Aveco—Valves. Associated Valve & Engineering Co., Chicago, Ill.

Axiflo—Fans. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

Axivane—Blowers, and fans. Joy Mfg. Co., Pittsburgh, Pa.

B.A.C.—Condensers, oil coolers, cooling towers. Baltimore Aircoil Co., Inc., Baltimore, Md.

BAC—Air conditioning units. Brunner Mfg. Co., Utica, N. Y.

B. B.—Blast gates. Berger Bros. Co., Philadelphia, Pa.

B & B—Heating and air conditioning equipment, fans, louvers & shutters, housings, washers, blower wheels. Bishop & Babcock Mfg. Co., Cleveland, O.
B & C—Plates, valves, unions. Beaton & Corbin Mfg. Co., Southington, Conn.
BCA—Bearings. Bearings Co. of America, Div. of Federal Mogul Bower Bearings, Inc., Lancaster, Pa.
B. & G.—Air eliminators, circulators, control for indirect water heaters, coolers, condensers, fittings, heat exchangers, heaters, heating systems, superheaters, temperature regulators, tanks, valves. Bell & Gossett Co., Morton Grove, Ill.
B-H—Insulation. Baldwin-Hill Co., Trenton, N. J.
B-H No. 1 Super Powerhouse—Insulation, insulating cement. Baldwin-Hill Co., Trenton, N. J.
B & J—Orifices, pumps, strainers, systems, traps, valves. Barnes & Jones, Inc., Newtonville, Mass.
B & K—Pipe cutting and threading machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
B.O.—Cocks, joints, valves. Bordo Co., Inc., L. J., Glenside, Pa.
B & P Enamel—Enamels and lacquers. Tropical Paint Co., Cleveland, O.
B.7.U.—Concrete. Zonolite Co., Chicago, Ill.
BU—Couplings. Dahl, G. W., Bristol, R. I.
B & W—Boilers, burners, desuperheaters, fuel economizers, refractories, stokers, superheaters. Babcock & Wilcox Co., Boiler Div., New York, N. Y.
B & W—Pipe fittings, flanges, tubes and tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bacite—Insulation, insulating cement. Bird-Archer Co., Philadelphia, Pa.
Baco—Soot destroyer, pumps. Bird-Archer Co., Philadelphia, Pa.
Badger—Time switches. Reliance Automatic Lighting Co., Racine, Wis.
Baflex—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.
Balance-trol—Heating systems. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Ball-Lok—Drives. V-Belt Clutch Co., Los Angeles, Calif.
Ball-Rite—Drills. Oster Mfg. Co., John, Milwaukee, Wis.
Baltograph—Machines and film, X-ray. Balteau Electric Corp., Stamford, Conn.
Baltospot—Machines and film, X-ray. Balteau Electric Corp., Stamford, Conn.
Bank Heat—Burners. Johnson Co., S. T., Oakland, Calif.
Banroc—Pipe insulation. Johns-Manville, New York, N. Y.
Bantam—Valves. Dahl, G. W., Bristol, R. I.
Barcol—Motors, operators. Barber-Colman Co., Rockford, Ill.
Bardex—Hose. Newage International, Inc., Jenkintown, Pa.
Barnes—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Barnes—Cutters. Erie Tool Works, Erie, Pa.
Bar-O-X—Protective coatings. Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich.
Barton-American—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
Basa Hammers—Tools. Greene, Tweed & Co., North Wales, Pa.
Basaltwool—Insulation. Thermo-Sound Products, Div. of Kittell-Lacy, Inc., El Monte, Calif.
Base Ray—Baseboard radiation. Burnham Corp., Irvington, N. Y.
Basic magnesite—Refractories and refractory cement. Basic Inc., Cleveland, O.
Basifrit—Refractories and refractory cement. Basic Inc., Cleveland, O.
Basmor—Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Baso—Valves. Milwaukee Gas Specialty Co., Milwaukee, Wis.
Bayce-Heet—Radiation. Brown Products Corp., Forest Hills, N. Y.
Bazooka—Torches. Deutsch Co., The, Los Angeles, Calif.
Beco—Boards, control systems, controllers and starters, relays, switches, tags. Burke Engineering, Los Angeles, Calif.
Beco-Cell—Corrosion treatment, devices, scale removal. Brown-Electro Co., Oklahoma City, Okla.
Behr-Cat—Tape. Norton Co., Worcester, Mass.
Bell-Ex—Ventilators. New York Blower Co., Chicago, Ill.
Bell-Pack—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Beloit—Machines, punches, power shears. Hendley & Whittemore Co., Beloit, Wis.
Berkshire—Hangers and supports. Armart Mfg. Co., Pittsfield, Mass.
Bermico—Fiber glass. Brown Co., Boston, Mass.
Bestfelt "Lamino Sponge"—Insulation. Keasley & Mattison Co., Ambler, Pa.
Bestoil—Pipe oil. Oster Mfg. Co., Cleveland, O.
Beth-Co-Weld—Pipe. Bethlehem Steel Co., Bethlehem, Pa.
Beth-Cu-Loy—Sheets. Bethlehem Steel Co., Bethlehem, Pa.
Bi-Air—Burners. John Zink Co., Tulsa.
Bifurcator—Fans. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Big Chief—Refractories and refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Bildrite—Insulation. Insulite Co., Minneapolis, Minn.
Biltin—Heaters. Taco Heaters, Inc., Cranston, R. I.
Bi-Mix—Burners. John Zink Co., Tulsa, Okla.
Binoc—Thermometers. Taylor Instrument Companies, Rochester, N. Y.
Bison—Boilers. Farrar & Trefts Div., ADSCO Industries, Inc., Buffalo, N. Y.
Bitumastic—Protective coatings, enamel and lacquers, high temperature paint. Koppers Co., Inc., Pittsburgh, Pa.
Bituplastic—Coatings. Koppers Co., Inc., Pittsburgh, Pa.
Black Baking Japans—Enamels and lacquers. Hilo Varnish Co., Div. of Carpenter-Morton Co., Everett, Mass.
Black-Buty—Plastic pipe and tubing. Anesite Co., Skokie, Ill.
Black-Poly—Plastic pipe and tubing. Anesite Co., Skokie, Ill.
Blakite—Cement. Johns-Manville, New York, N. Y.
Blazecrete—Refractories. Johns-Manville, New York, N. Y.
Blend-Air—Ducts and duct fittings, heaters, air conditioning units. Coleman Co., Inc., The, Wichita, Kans.
Blenders—Diffusers. Coleman Co., Inc., The, Wichita, Kans.
Bloapco—Dust collectors. Blower Application Co., Milwaukee, Wis.
Blu-Cold—Compressors. Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Blu-Flame—Burners, heaters. Vacuum Gas Burners, Olean, N. Y.
Blue Circle—Heating boilers. Dunkirk Radiator Corp., Dunkirk, N. Y.
Blue Dot—Benders. Imperial Brass Mfg. Co., Chicago, Ill.
Blue-Point—Cutters, Tools, wrenches. Snap-on Tools Corp., Kenosha, Wis.
Blue Ribbon—Headers and nipples. Chicago Nipple Mfg. Co., Cicero, Ill.
Blue Streak—Dehydrators. Wabash Corp., Chicago, Ill.
Boardman—Pump governors. Locke Regulator Co., Salem, Mass.
Boilergard—Low water cut-offs. Maid-O'-Mist, Inc., Chicago, Ill.
Boiler-Lox—Compounds. Radiator Specialty Co., Charlotte, N. C.
Boiler Solder Seal—Compounds. Radiator Specialty Co., Charlotte, N. C.
Boltaron—Tubing. LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Boltaron 6200—Pipe fittings, plastic pipe, plastic sheets, plastic tubing, valves. H. N. Hartwell & Son, Inc., Boston, Mass.
Bolt-O-Seal—Bolts. Wolfe Co., Inc., Franklin C., The, Culver City, Calif.
Bondwich—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Booster—Units, fuel oil. Cleaver-Brooks Co., Milwaukee, Wis.
Borgana—Compounds, treatments. Strong, Carlisle & Hammond, Cleveland, O.
Bosco—Clay pipe. Bowerston Shale Co., The, Bowerston, O.
Branford—Unions. Malleable Iron Fittings Co., Branford, Conn.
Brassweld—Compounds. Sight Feed Generator Co., West Alexandria, O.
Braxon—Compounds, scale removal, water treatment. Anderson Chemical Co., Inc., Macon, Ga.
Brazaloy Fluxes—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Brazolets—Fittings. Bonney Forge & Tool Wks., Allentown, Pa.
Breeze—Adsorbers. Barnebey-Cheney Co., Columbus, O.
Breeze Master—Fans. Acme Equipment Co., Muskogee, Okla.
Breezo—Fans. Buffalo Forge Co., Buffalo, N. Y.
Breezy-Air—Air conditioning units. Barwick Mfg. Corp., Wichita, Kan.
Brilliant Fire—Heaters. Ohio Foundry & Mfg. Co., Steubenville, O.
Brite Kote—Valves. Hammond Brass Works, Hammond, Ind.
Bronco—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Bronze-Arc C—Electrodes. Alloy Rods Co., York, Pa.
Bronze-Arc Mn—Electrodes. Alloy Rods Co., York, Pa.
Bronze-Chem—Rotary pumps. Eco Engineering Co., Newark, N. J.
Bronze-Chrom—Gas welding rod. Eutectic Welding Alloys Corp., Flushing, N. Y.
Bronzende—Electrodes. Arcos Corp., Philadelphia, Pa.
Bronzeweld—Compounds. Sight Feed Generator Co., West Alexandria, O.
Brule—Incinerators. Goder Incinerator Corp., Chicago, Ill.
Built-In Thinline—Air conditioning units. General Electric Co., Appliance & Television Receiver Div., Louisville, Ky.
Bulator—Grilles. Hendrick Mfg. Co., Carbondale, Pa.
Bulk-Flo—Conveyors. Link-Belt Co., Chicago, Ill.
Bulldog—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Bulldog—Bolts. Polis Mfg. Co., J. D., Chicago, Ill.
Bulldog—Shears and snips. Wiss & Sons Co., J., Newark, N.J.
Bull Dog—Stocks and dies. Oster Mfg. Co., Cleveland, O.
Bull Dog—Pulleys and sheaves. Boston Woven Hose & Rubber Co., Cambridge, Mass.
Bull Dog—Valves. The Carpenter Valve Corp., Cleveland, O.
Bull's Eye—Glasses. Fischer & Porter Co., Hatboro, Pa.
Bullet—Filters. Sealed Unit Parts Co., Inc., Bronx, N. Y.
Burdco—Blades, fans. Burden Co., Alan E., Los Angeles, Calif.
Burkay—Heaters. Smith Corp., A. O., Milwaukee, Wis.
Burks—Pumps. Decatur Pump Co., Decatur, Ill.
Burnham—Compressors, pumps. Union Steam Pump Co., Battle Creek, Mich.
Buster—Shears and snips. Lidseen, Inc., Gustave, Hayesville, N. C.

CBR System—Air sterilizing units. Kewaunee Mfg. Co., Adrian, Mich.
C-E—Boilers, stokers, fuel economizers. Combustion Engineering, Inc., New York.
C-E Heatmaster—Air conditioning units, water heaters. Combustion Engineering, Inc., New York, N. Y.
C-E Lamont Controlled Circulation—Heating systems. Combustion Engineering, Inc., New York, N. Y.
C-E Raymond—Air separators. Combustion Engineering, Inc., New York, N. Y.
C-E Raymond Flash Dryer—Dryers. Combustion Engineering, Inc., New York, N. Y.
C-E Spreader—Stokers. Combustion Engineering, Inc., New York, N. Y.
C-H—Alarms, controllers and starters, heaters, relays, regulators, switches, operators, valves. Cutler-Hammer, Inc., Milwaukee, Wis.
CHPE Controller—Regulators. Hays Corp., The, Michigan City, Ind.
C & L—Heaters, torches. Clayton & Lambert Mfg. Co., Louisville, Ky.
CM—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
CMC Aluminum—Enamels and lacquers. Acorn Paint & Chemical Co., Cleveland, O.
C & M—Hangers or brackets, inserts. Carty & Moore Engineering Co., Detroit, Mich.
CP—Aftercoolers, clamps, compressors, engines, expanders, grinders and grinding wheels, hoists, machines, pumps, tools. Chicago Pneumatic Tool Co., New York, N. Y.
C & R—Regulators. Automatic Control Co., St. Paul, Minn.
CS - Completely Silent—Diaphragm valves. White-Rodgers Co., St. Louis, Mo.
CS—Air conditioning units. Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U.S. Radiator Corp., Johnstown, Pa.
CSP—Transformers. Westinghouse Electric Corp., Pittsburgh, Pa.
CTF—Pipe fittings. Clyde Tube Forgings Co. of America, Inc., Portland, Ore.
CTFA—Pipe flanges. Clyde Tube Forgings Co. of America, Inc., Portland, Ore.
CW—Pipe. Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
CWF—Chillers. Taco Heaters, Inc., Cranston, R. I.
Cablestat—Cable. Wiegand Co., Edwin L., Pittsburgh, Pa.
Cadillac—Meters. Central Station Steam Co., Detroit, Mich.
Cafco—Insulation cement. United States Mineral Wool Co., Stanhope, N. J.
Calco—Valves. California Brass Mfg. Co., Los Angeles, Calif.
Cal-Fin—Pipe, tubing, radiation. Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Calktite—Cement and compounds. United States Stoneware Co., New York, N. Y.
Calol—Protective coatings. Standard Oil Co. of California, San Francisco, Calif.
Calorex—Oil burners. W. N. Best Combustion Equipment Co., Inc., Carlstadt, N.J.
Caltemp—Insulation. Fibreboard Paper Products Corp., San Francisco, Calif.
Camomatic—Valves. Belco Industrial Equipment Div., Bogue Electric Mfg. Co., Paterson, N. J.
Campbell—Regulators, controls. Fuel Reduction Corp., Chicago, Ill.

Capacilogs—Temperature recorders. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Capacitrols—Indicator - controllers. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Capillary—Air washers. Clarage Fan Co., Kalamazoo, Mich.
Capillary—Air washers, humidifiers, cooling towers, unit air conditioners. Air & Refrigeration Corp., New York, N. Y.
Capitolaire—Furnaces, compressors, radiation, air conditioning units. National-U. S. Radiator Corp., Johnstown, Pa.
CaPlugs—Fittings, plugs. Protective Closures Co., Inc., Buffalo, N. Y.
Caposil—Cement, insulation. North American Asbestos Corp., Chicago, Ill.
Caposite—Cement, insulation. North American Asbestos Corp., Chicago, Ill.
Capri—Air conditioning units. Frigid, Inc., Brooklyn, N. Y.
Carbolite—Soot destroyers. Ampion Corp., Long Island City, N. Y.
Carbozite—Coatings. Ohmlac Paint & Refining Co., Long Island City, N. Y.
Careycel—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
Cascade—Water heaters. The Cleveland Heater Co., Cleveland, O.
Cash-Acme—Heating systems, feeders, pipe strainers, regulators, valves. Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cassel—Templates. Graphic Indicator Co., Los Angeles, Calif.
Castalu—Fans, wheels. Advance Aluminum Castings Corp., Chicago, Ill.
Cast-Refract—Refractories. Quigley Co., Inc., New York, N. Y.
Catalina—Radiators, electric. Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Catch-All—Dehydrators and filters. Sporlan Valve Co., St. Louis, Mo.
Causul—Valves. Lunkenheimer Co., Cincinnati, O.
CC Coatings—Protective coatings, paint. Chemical Solvent Co., Birmingham, Ala.
Cell Concrete—Concrete. Dockstader, Inc., S. E., Washington, D. C.
Celoron—Couplings. Continental-Diamond Div. of the Budd Co. Inc., Newark, Del.
Cemcoat—Enamels and lacquers. Sonneborn Sons, Inc., L., New York, N. Y.
Cementseal—Enamels and lacquers. Acorn Paint and Chemical Co., Cleveland, O.
CenTraVac—Compressors. Trane Co., The, La Crosse, Wis.
Centri-Chem—Centrifugal pumps. Eco Engineering Co., Newark, N. J.
Centripac—Packing. Johns-Manville, New York N. Y.
Centripeller—Roof ventilators. Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Century—Pipe. Keasbey & Mattison Co., Ambler, Pa.
Century—Boilers. Smith Co., Inc., H. B., The, Westfield, Mass.
Cert-a-bar—Conduits. Stillwater Clay Products Co., The, Cleveland, O.
Certified Climate—Air conditioning units, washers. Parks-Cramer Co., Fitchburg, Mass.
Cesco—Fittings. Columbia Engineering Service Co., Santa Rosa, Calif.
C-Flux—Solder and fluxes. American Solder & Flux Co., Philadelphia, Pa.
Chamfer Trade—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Champ—Non-metal hose. LE-HI Div., Hose Accessories Co., Philadelphia, Pa.
Champion—Furnaces, heaters. National Heater Co., St. Paul, Minn.
Champion—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Champion—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Charg-A-Can—Refrigerants. American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif.
Chemiseal—Seals, gaskets, joints, packing, couplings, shaft. United States Gasket Co., Camden, N. J.
Chem-o-Feeder—Feeders, pumps, water treatment. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chem-O-Shot—Pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chempac—Gaskets, packing. Johns-Manville, New York N. Y.
Chevron—Packing. Garlock Packing Co., Palmyra, N. Y.
Chex-Spray—Valve bonnet shields. Industrial Products Co., Philadelphia, Pa.
Chicago—Brakes. Dreis & Krump Mfg. Co., Chicago Ill.
Chill Air—Air conditioning units, fans. National Engineering & Mfg. Co., Sedalia, Mo.
Chil-Lator—Coolers. McQuay, Inc., Minneapolis, Minn.
CHILL VACTOR—Steam jet compressors. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Chimney Crown—Caps. Coleman Co., Inc., The, Wichita, Kans.
Chimney Sweep—Chemical destroyers. Coughlan Co., G. N., West Orange, N. J.
Chinoov—Ferrous heating surface. Bayley Blower Co., Milwaukee, Wis.
Chlorimet—Heat exchangers, fans, fittings, heaters, pipe, pumps, nozzles, valves. Duriron Co., Inc., The, Dayton, O.
Chlorinizer—Chlorinators, and treatment. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chlor-O-Feeder—Feeders, pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chlor-O-Mite—Pumps, water treatment. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chore Boy—Incinerators. Incinerator Products, Inc., Detroit, Mich.
Chore Boy—Burners. Standard Fuel Engineering Co., Detroit, Mich.
Chromalox—Heat exchangers, preheaters, pipe thawers, fuel oil units, dryers, indicator-controllers, heating systems, radiation, superheaters, thermostats, unit heaters. Wiegand Co., Edwin L., Pittsburgh, Pa.
Chrome—Packing. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Chrome Lock—Gaskets, tape. Products Research Co., Los Angeles, Calif.
Chromend—Electrodes. Arcos Corp., Philadelphia, Pa.
ChromiCoat—Protective coatings. Oakite Products, Inc., New York, N. Y.
Chromix—Refractories. Quigley Co., Inc., New York, N. Y.
Chronoflo—Flow meters, gages, recorders. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chronometer—Valves. Defender Instrument & Regulator Co., Boody, Ill.
Chronotherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis.
Cinch—Expansion bolts. National Lead Co., New York, N. Y.
Circle-Air—Convection radiation. Paley Mfg. Corp., Brooklyn, N. Y.
Circu-Ray—Heaters. Temco, Inc., Nashville, Tenn.
Clair-Tex—Connections. St. Clair Rubber Co., Detroit, Mich.
Clamp-A-Leak—Pipe repair clamps. Chelsea Metal Stamping Co., New York, N. Y.
Clarco—Unit heaters. Clarage Fan Co., Kalamazoo, Mich.
Cla Rite—Filters. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Claymont—Steel pipes. Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Clean Right—Soot destroyers. General Filters, Inc., Novi, Mich.
Clear-stream—Treatment. Reynolds Shaffer Co., Detroit, Mich.
Clearstream—Hose, nonmetal; pipe fittings; plastic pipe; plastic tubing. Yardley Plastic Co., Columbus, O.
Clearview—Gages. Boston Machine Works Co., Lynn, Mass.
Cleveland—Heaters. Hotstream Heater Co., Cleveland, O.
Clevite—Bearings. Cleveland Graphite Bronze Co., Cleveland, O.
Cliff—Boilers, water heaters. Terre Haute Boiler Works Co., Terre Haute, Ind.
Climate Changer—Unit air conditioners. Trane Co., The, LaCrosse, Wis.
Climate-Lab—Test chambers. American Instrument Co., Inc., Silver Spring, Md.
Climatrol—Boilers, furnaces, heaters, fans, air conditioning units. Mueller Climatrol, Milwaukee, Wis.
Climax—Governors, regulators, strainers, steam traps, valves. Black, Sivalls & Bryson Inc., Kansas City, Mo.
Clipper—Fans. Trade-Wind Motorfans, Inc., Rivera, Calif.
Clipper—Refractories and refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Clipper Seals—Packing seals. Johns-Manville, New York.
Clorodine—Boiler cleaning compounds, American Chemical Paint Co., Ambler, Pa.
Closin—Bolts. Star Expansion N.Y., Inc., New York, N. Y.
Cocheo—Belting. Williams & Son, I. B., Dover, N. H.
Coeco—Controls and dampers. Combustion Equipment Co., Moline, Ill.
Cold Generator—Chillers. Trane Co., The, La Crosse, Wis.
Cold Plate—Coils, condensers, coolers, dryers. Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N. Y.
Coltemp—Insulation. Badham Insulation Co., Inc., Birmingham, Ala.
Columbia—Water heaters, air conditioning units. National Steel Construction Co., Logansport, Ind.
Columbia—Air conditioning units. Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.
Columbia—Ventilators. E. E. Souther Iron Co., St. Louis, Mo.
Combi-Matic—Burners. Siemon Mfg. Co., Grandview, Mo.
Combustioner—Humidifiers. Steel Products Engineering Co., Springfield, O.
Comet—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Comfort Control—Temperature regulators. Bell & Gossett Co., Morton Grove, Ill.
Comfortaire—Air conditioning units. American Coils Co., Newark, N. J.
Comfostat—Thermostats. Johnson Service Co., Milwaukee, Wis.
Cominco—Insulating cement, insulation. United States Mineral Wool Co., Stanhope, N. J.
Commercial-Aire—Heaters. Mammoth Furnace Co., Minneapolis, Minn.
Compact Scotch—Boilers. Titusville Iron Works Co., The, Titusville, Pa.
Compass—Belting. Goodyear Tire & Rubber Co., Akron, O.
Compound Lever—Hand shears and snips. Bartlett Mfg. Co., Detroit, Mich.
Conco—Boiler cleaning compounds, water treatment. Continental Products Co., Euclid, O.
Condenseal—Pipe insulation, tubing. Jarrow Products, Chicago, Ill.
Condor—V-belts, hose, pipe. Raybestos-Manhattan, Inc., Passaic, N. J.
Condo-Vac—Vacuum pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Conflex—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Coni-Vane—Ventilators. Allen Cooler & Ventilator, Inc., Rochester, Mich.
Connect-O-Matic—Pipe couplings. Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Conomotors—Duct and valve operators. Conoflow Corp., Subsidiary of Walworth Co., Philadelphia, Pa.
Conseco—Water chillers, oil coolers, dryers, heat exchangers, filters, headers, water heaters, joints, preheaters, separators, superheaters. Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Consolaire—Air Conditioning Units. Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Consolidated—Valves. Manning, Maxwell & Moore, Inc., Stratford, Conn.
Constellation Line—Arc welders. Trindl Products, Ltd., Chicago, Ill.
Con-Tac-Ton—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Continental—Boilers. Boiler Engineering & Supply Co., Phoenixville, Pa.
Continental——Heaters. National Steel Construction Co., Logansport, Ind.
Continuous Flow—Heating Systems. Webster & Co., Warren, Camden, N. J.
Control-by-the-Weather—Heating Control. Webster & Co., Warren, Camden, N. J.
Convector—Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.
Converto—Roof ventilators. Ammerman Co., Inc., Minneapolis, Minn.
Conveyoflo—Conveyors. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Conveyor—Pulleys and Sheaves. The American Pulley Co., Philadelphia, Pa.
Cool-A-Matic—Air conditioning units. Automatic Corp., St. Louis, Mo.
Coolero—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N.Y.
Coolite—Windows. Mississippi Glass Co., St. Louis, Mo.
Coolmaster—Unit coolers. Kramer Trenton Co., Trenton, N. J.
Cool-Mate—Air conditioning units. Weil-McLain Co., Michigan City, Ind.
Coolube—Oil. Warren Refining & Chemical Co., The, Cleveland, O.
Copaltite—Cement and compounds, gaskets. National Engineering Products, Inc., Washington, D. C.
Cop-R-Loy—Sheets. Wheeling Corrugating Corp Wheeling, W. Va.
Cop-R-Loy—Sheets, pipe. Wheeling Steel Corp. Wheeling, W. Va.
Copr-fibre—Insulation. Forty-Eight Insulations, Inc., Aurora, Ill.
Copr-Tube—Fittings. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Copyflex—Blueprint machine. Bruning Co., Inc., Charles, Chicago, Ill.
Cordan—Leather belting and V belts. Sikes Co., S. R., Minneapolis, Minn.
Cor-In Galvanode—Electrolytic devices. Rotometals, San Francisco, Calif.
Cork-Flex—Bases and pad, noise elimination for cooling towers. Vibration Mountings, Inc., Corona, N. Y.
Cork-Rib—Bases and pad. Vibration Mountings, Inc., Corona, N. Y.
Corox—Heaters. Westinghouse Electric Corp., Pittsburgh, Pa.
Corrocote—Coatings. Chemical Coatings & Engineering Co., Edgemont, Pa.
Corrodicide—Water treatment, compounds. Metropolitan Refining Co., Inc., Long Island City, N. Y.

Corrodine—Compound and water treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Corson-Cerveny Micro-Bellows Pump—Feeders. Research Appliance Co., Allison Park, Pa.
Cottrell—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.
Counterflo—Furnaces. Dravo Corp., Machinery Div., Pittsburgh, Pa.
Cox—Water heaters. O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
Coxe—Stokers. Combustion Engineering, Inc., New York, N. Y.
Cozy—Wall heaters. Advance Furnace Co., Wichita, Kans.
Crag—Treatment. Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N.Y.
Crescent—Boiler gage cocks. Wright-Austin Co., Detroit, Mich.
Crescent—Valves. Powell Co., Wm., The, Cincinnati, O.
Cresline—Plastic fittings, pipe, tubing. Crescent Plastics, Inc., Evansville, Ind.
Crest—Water heaters. Day & Night Mfg. Co., Monrovia, Calif.
Crispin—Air eliminators, pipe joints, valves. Multiplex Mfg. Co., Berwick, Pa.
Croloy—Pipe, tubes, and tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Cross-Flo—Dehydrators. Remco, Inc., Zelienople, Pa.
Cryscoat—Protective coatings. Oakite Products, Inc., New York, N. Y.
Crystolon—Refractories and refractory cement, furnace cement. Norton Co., Worcester, Mass.
Cummins—Drills. Oster Mfg. Co., John, Milwaukee, Wis.
Curtiss—Air conditioning units. Kleer Kleen Mfg. Co., Hayward, Calif.
Cushioned Power—Valves. White-Rogers Co., St. Louis, Mo.
Cutno—Packing. Greene, Tweed & Co., North Wales, Pa.
Cut-O-Matic—Flame cutters. National Cylinder Gas Co., Chicago, Ill.
Cut Trode—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Cyclon—Plastic tubing. Munray Products, Inc., Cleveland, O.
Cyclone—Exhaust heads. Wright Austin Co., Detroit, Mich.
Cyclone—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Cyclonetic—Burners. Webster Engineering Co., Tulsa, Okla.
Cyclothene—Plastic tubing. Munray Products, Inc., Cleveland, O.

DFN—Dehydrators, filters, sight glasses, indicators, mufflers, strainers. McIntire Co., The, Livingston, N. J.
D.I.P.—Bends, insulation, conduit, pre-insulated pipe. Durant Insulated Pipe Co., Palo Alto, Calif.
D.I.P.—Insulation, conduit, pre-insulated pipe. Durant Insulated Pipe Co., Inc., Williamstown, N. J.
D-O Kote—Adsorbers. Research Products Corp., Madison, Wis.
DRC-Blue Circle—Baseboard radiation. Dunkirk Radiator Corp., Dunkirk, N. Y.
DY—Softeners. Stover Water Softener Co., St. Charles, Ill.
Dacor—Adsorbers, air filters. Barnebey-Cheney, Inc., Columbus, O.
Daffinaire—Humidifiers. Hermidifier Co., Neffsville, Pa.
Dampermatic—Baseboard radiation. Beacon-Morris Corp., Boston, Mass.
Damperset—Regulators. Elgen Mfg Co., Long Island City, N.Y.
Darcova—Packing. Sims Pump Valve Co., Hoboken, N. J.
Dart—Unions, fittings. Fairbanks Co., The, New York, N. Y.
Day-Nite Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Day-Steel—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.
Dean—Cleaners. Pierce Co., Wm. B., The, Buffalo, N. Y.
Debecote—Coatings. Debevoise Co., The, Brooklyn, N. Y.
Deep Bed Multi-Pak—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Deflectrol—Turning vanes. Barber-Colman Co., Rockford, Ill.
Defrostolator—Hot gas defrosting systems. Tenney Engineering, Inc., Union, N. J.
Dehydrators—Dehumidifiers. Selas Corp. of America, Dresher, Pa.
Dekoron—Protective coatings, tubing. Moore & Co., Samuel, Mantua, O.
Delaytrol—Valves. Webster Electric Co., Racine, Wis.
Delta—Steel boilers. Zingham Co., William C., Chicago, Ill.
Demi—Valves, manifolds & headers. Dahl, G. W., Bristol, R. I.
Demi-Purge—Meters. Dahl, G. W., Bristol, R. I.
Demon Air-Set—Refractories. Plibrico Co., Chicago, Ill.
Densitron—Alarms. Ripley Co., Inc., Middletown, Conn.
Deodorite—Air freshening compounds. Barnebey-Cheney Co., Columbus, O.
Deoxidine—Cleaning compounds. American Chemical Paint Co., Ambler, Pa.
Dereka—Protective coatings. Debevoise Co., The, Brooklyn, N. Y.
Design-D-Air—Diffusers. Krueger Air Conditioning Co., Tucson, Ariz.
De-Sta-Co.—Fan housings, pipe clamps, valves. Detroit Stamping Co., Detroit, Mich.
Detect-A-Fire—Controls. Fenwal Inc., Ashland, Mass.
Detroit—Traps. Nason Co., Clarkston, Mich.
Dexter—Valve reseaters, air separators, steam traps. Leavitt Machine Co., Orange, Mass.
Dexter Auto Sep—Filters. Leavitt Machine Co., Orange, Mass.
Di-Acro—Benders, brakes, machines, punches, shears. O'Neil-Irwin Mfg. Co., Lake City, Minn.
Dial-A-Speed—Motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Diamond—Compounds, enamels and lacquers. Thompson and Co., Oakmont, Pa.
Diamond Fibre—Gaskets. Continental Diamond Div. of the Budd Co. Inc., Newark, Del.
Diamond—Valves. Imperial Brass Mfg. Co., Chicago, Ill.
Diamond—Adsorbers, filters, water treatment. Oshkosh Filter & Softener Co., Oshkosh, Wis.
Diamond H—Switches, thermostats, relays. Hart Mfg. Co., Hartford, Conn.
Diaphlex—Bellows, relays, solenoids, and switches. Cook Electric Co., Chicago, Ill.
Dieselite—Compounds. Metropolitan Refining Co., Inc., Long Island, N. Y.
Diffusaire—Diffusers. Hart & Cooley Mfg. Co., Holland, Mich.
Dilecto—Plastic pipe and tubing. Continental Diamond Div. of the Budd Co. Inc., Newark, Del.
Dill Dust Spot Tester—Tester, dust spot. Research Appliance Co., Allison Park, Pa.
Dimetcote—Coatings. Amercoat Corp., South Gate, Calif.
Directrol—Vanes. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Distributor—Radiation. Kehm Corp., The, Chicago, Ill.
Divco—Fittings, coils, pipe and tubing, sheets, plugs, solder, valves. Division Lead Co., Summit, Ill.
Dixigas—Gas welding rod. Atlantic Steel Co., Atlanta, Ga.
Dixisteel—Angles, bars, beams, channels and tees. Atlantic Steel Co., Atlantic, Ga.
Do-All—Drills, tools. Wodack Electric Tool Corp., Chicago, Ill.
Dominion—Gaskets, packing. Darcoid Co., Inc., New York, N. Y.
Do-Mor-Ad—Saw tools. Pioneer Tool Co., Racine, Wis.
Dorex—Adsorbers. Connor Engineering Corp., Danbury, Conn.
Doro-Chrome—Benders, cutters, tools, wrenches. Duro Metal Products Co., Chicago, Ill.
Double Check—Boiler compounds. Hampton-Cross Co., The, Louisville, Ky.
Double Diamond—Hygrometers, regulators, psychrometers, thermometers. H. B. Instrument Co., Philadelphia, Pa.
Double-Flow—Cooling towers. Marley Co., The, Kansas City, Mo.
Double Retort Stoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Double-Seal—Copper tube fittings. Hays Mfg. Co., Erie, Pa.
Doubleton—Pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
DovRloy—Steel sheets. Reeves Steel & Mfg. Co., Dover, O.
Dowflake—Dehumidifiers. Dow Chemical Co., The, Midland, Mich.
Dowmetal—Sheets, tubing, welding rod. Dow Chemical Co., Midland, Mich.
Downblast—Unit heaters. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Downflow—Unit heaters. McQuay, Inc., Minneapolis, Minn.
Dowtherm—Process heating systems. Dow Chemical Co., The, Midland, Mich.
Draft-A-Justor—Draft controls. Preferred Utilities Mfg. Corp., New York, N. Y.
Draftender—Regulators. Penn Controls, Inc., Goshen, Ind.
Draft King—Caps, vent flue. Wood Mfg. Co., A. R., Luverne, Mich.
Draft Korektor—Controls. Cole-Sewell Engineering Co., St. Paul, Minn.
Draft-O-Stat—Barometric controls. Hotstream Heater Co., Cleveland, O.
Draftrite—Gages. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Draftrite—Gages. Cole-Sewell Engineering Co., St. Paul, Minn.
Draftstop—Ventilators. American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
Dragnet—Leak detectors, testers. Universal Controls Corp., Dallas, Tex.
Dragon—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N.J.
Drainator—Traps. Coe Mfg. Co., Painesville, O.
Drain-Dri—Sump pumps. Yeomans Bros. Co., Melrose Park, Ill.
Draintrol—Traps. Schaub Engineering Co., Fred H., Chicago, Ill.
Dri-Fan—Condensers, cooling towers. Refrigeration Engineering, Inc., Los Angeles, Calif.
Drifreeze—Dehydrant and acid neutralizer, dehydrators. Berna Corp., Garwood, N. J.
Driline—Dehumidifiers. Desomatic Products, Inc., Falls Church, Va.
Dri-Pipe—Insulation. Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
Drip-pump—Pumps. Peerless of America, Inc., Chicago, Ill.
Drive-IT—Hangers and supports, fasteners. Omark Industries, Portland, Ore.
Dry-Eye—Dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Dry-Ex—Water chillers. Acme Industries, Inc., Jackson, Mich.
Dryfol—Insulation. Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.
Dry-Ice—Refrigerants. Pure Carbonic Co., Div. of Air Reduction Co., Inc., New York.
Drymaster—Dehumidifiers. Dryomatic Corp., Alexandria, Va.
Dry-O-Matic—Dehumidifiers. Abbeon Supply Co., Jamaica, N. Y.
Dryvin—Expansion bolts. Star Expansion N. Y., Inc., New York, N. Y.
Dual Adjusta-Flo—Valves. Sullivan Valve & Engineering Co., Butte, Mont.
Dualaire—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.
Dualarc—Arc Welders. Electric Arc, Inc., Newark, N. J.
Dual-Clone—Dust collectors. Day Co., The, Minneapolis, Minn.
Dual-Dial—Gages. Rochester Mfg. Co., Inc., Rochester, N. Y.
Dual-A-Fire—Burners. Automatic Corp., St. Louis, Mo.
Dualene—Fuel oil treatment. Allen Co., Robert G., Mechanicsville, N. Y.
Dualsteel—Unions. Rockwood Sprinkler Co., Worcester, Mass.
Dualvector—Air conditioning units. Kritzer Radiant Coils, Inc., Chicago, Ill.
Dualvent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Dubl-Dome—Heat insulating windows. Bettcher Plastics Co., Portland, Ore.
Duboth—Boiler water treatment, compounds. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Duclone—Dust collectors. Ducon Co., The, Mineola, N. Y.
Duco—Enamels and lacquers. du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Ductatherm—Thermostats. Mercoid Corp., The, Chicago, Ill.
Duct Fabric—Cloth. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Ducturns—Vanes. Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Ductype—Fans. South Bend Air Products, Inc., South Bend, Ind.
Dulux—Enamels and lacquers. du Pont de Nemours & Co., E. I., Finishes Div., Wilmington, Del.
Dum Dum—Sealing compounds. Arco Co., The, Cleveland, O.
Duo Blo—Air heaters. American Furnace Co., St. Louis, Mo.
Duo Equalizing HypTor—Pipe joints. Zallea Brothers, Wilmington, Del.
Duonetic—Gas and oil burners. Webster Engineering Co., Tulsa, Okla.
Duo-Stat—Heating systems, thermostats. Johnson Service Co., Milwaukee, Wis.
Duotrol—Regulators, indicators, switches. Automatic Control Co., St. Paul, Minn.
Duplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Duplex—Pipe cutting machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
Duplex Twin Rail—Bases and pads. Korfund Co., Inc., Long Island City, N. Y.
DuraBilt—Registers. Auer Register Co., Cleveland, O.
Dura-Flex—Registers. Auer Register Co., Cleveland, O.
Duraflex—Stokers. Canton Stoker Corp., Canton, O.
Dura-Line—Registers. Auer Register Co., Cleveland, O.
Duranite—Enamels and lacquers. Atlas Powder Co., Industrial Finishes Dept., North Chicago, Ill.
Duratex—Adhesives and protective coatings, solvent. National Pipe Coating, Inc., Huntington Park, Calif.

Durco—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.
Durcopump—Fans, fittings, heaters, exchangers, nozzles, pumps, pipe, valves. Duriron Co., Inc., Dayton, O.
Durex—Bearings. Moraine Products Div., General Motors Corp., Dayton, O.
Durichlor—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.
Duridine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Durimet—Fans, fittings, heaters, exchangers, nozzles, pumps, pipe, valves. Duriron Co., Inc., Dayton, O.
Duro-Blade—Regulators. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Durolite—Insulation. Insulite Div., Minnesota & Ontario Paper Co., Minneapolis, Minn.
Duro-Metal-FAB—Duct connections, ducts and duct fittings. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Durospead—Heads. Grinnell Co., Inc., Providence, R. I.
Duro-Vane-Rail—Vanes. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Dur-X—Plastic fittings and pipes. Franklin Plastics, Inc., Franklin, Pa.
Dustay—Filters. Air-Maze Corp., Cleveland, O.
Dust King—Dust collectors. Dust Filter Co., Chicago, Ill.
Dustkop—Dust collectors. Aget-Detroit Co., Ann Arbor, Mich.
Dust Master—Dust collectors. Bannister Co., Inc., Cambridge, Mass.
Dustronic—Air filters. Radex Corp., Chicago, Ill.
Dust-Stop—Air Filters. Owens-Corning Fiberglas Corp., Toledo, O.
Dustube—Dust collectors. Wheelabrator Corp., Mishawaka, Ind.
Dutch Boy—Solder, protective coatings, enamels and lacquers. National Lead Co., New York, N. Y.
Duxbak—Leather belting and packing. Schieren Co., Chas. A., New York, N. Y.
Dux-Sulation—Insulation. Grant Wilson, Inc., Chicago, Ill.
Dy-Chek—Dye penetrant. Turco Products, Inc., Los Angeles, Calif.
Dyanfan—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.
Dynaflow—Fans. South Bend Air Products, Inc., South Bend, Ind.
Dyna-Line—Electric motors, reducers. Brown-Brockmeyer Co., Inc., Dayton, O.
Dyn-A-Matic—Water softeners. Modern Div., George Getz Corp., Rockford, Ill.
Dyna-Pac—Air conditioning units. Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U.S. Radiator Corp., Johnstown, Pa.
Dynapump—Circulators, pumps. Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Dyne-Aire—Heaters. American Foundry & Furnace Co., Bloomington, Ill.
Dynetic—Gas burners. Webster Engineering Co., Tulsa, Okla.
Dynetric—Balancing equipment. Gisholt Machine Co., Madison, Wis.

E-C—V belts. Goodyear Tire & Rubber Co., Akron, O.
E C & M—Motor controllers and starters, switches. Electric Controller & Mfg. Co., Div. of Square D Co., Cleveland, O.
EFR—Meters. Hays Corp., The, Michigan City, Ind.
E-Cell—Air filters. American Air Filter Co., Inc., Louisville, Ky.
E-Klean—Air filters. American Air Filter Co., Inc., Louisville, Ky.
E-Matic—Air filters. American Air Filter Co., Inc.,. Louisville, Ky.
EMD—Blowers. L. J. Wing Mfg. Co., Linden, N. J.
EMS—Compounds, detectors, destroyers, feeders, solvent, water filters, scale removal, water softeners, treatment. Smith Chemical Co., E. W., La Puente, Calif.
E-PL—Air filters. American Air Filter Co., Inc., Louisville, Ky.
ES—Sheets. Eastern Stainless Steel Corp., Baltimore, Md.
E-Z—Registers, regulators, hangers and supports. Acme Mfg. Co., Philadelphia, Pa.
E.Z.—Hangers or brackets, Inserts. Healey Ruff Co., St. Paul, Minn.
E-Z—Cutters. Collins Machinery Corp., Los Angeles, Calif.
EZ Code—Electric wire. Westline Products Div. of Western Lithograph Co., Los Angeles, Calif.
E-Z-On—Regulators. Gerett Corp., M. A., Milwaukee, Wis.
E-Z See—Glasses. Remco, Inc., Zelienople, Pa.
Easy-Flo—Solder. Handy & Harman, New York, N. Y.
Easy-Wrap—Protective coatings, pipe and tubing insulation. Rhopac, Inc., Skokie, Ill.
Ebko—Bends, conduit, preheaters, exchangers, pipe, systems, leak testers. Kaiser Co., E. B., Glenview, Ill.
Econ-O-Fab—Duct connections, ducts and duct fittings. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Econofeed—Pumps, systems. Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Econ-O-Flow—Furnaces. Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Econ-O-Matic—Motor bases. American Pulley Co., The, Philadelphia, Pa.
Economist—Boilers. Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Economite—Commercial and industrial gas burners. Mid-Continent Metal Products Co., Chicago, Ill.
Economizer—Nozzles. Bahnson Co., Winston-Salem, N. C.
Economo—Burners. Dalzen Mfg. Co., St. Clair, Mich.
Economy—Unit ventilators. Arex Co., Chicago, Ill.
Econostat—Heating systems. Barber-Coleman Co., Rockford, Ill.
Econotherm—Boilers. Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Econotowers—Cooling towers. Santa Fe Tank & Tower Co. of Texas, an Affiliate of Fluor Products Co., Garland, Texas.
Econovent—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.
EDCO—Heaters. Cauhorn Distributing Co., Detroit, Mich.
Edgeseal—Air filters. Wilson & Co., Inc., Chicago, Ill.
Edgetallic—Gaskets. Darcoid Co., Inc., New York, N. Y.
Effico—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Ejectopump—Pumps. Ferro Corp., Cleveland, O.
Elastic Metallic—Packing. Chesterton Co., A. W., Everett, Mass.
Elastic Porcelain—Tank linings. Porce-Lin Tank Lining Co., Detroit, Mich.
Elasto Rib—Vibration isolating bases. Korfund Co., Inc., Long Island City, N. Y.
Elaterite—Coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.
Elbolets—Fittings. Bonney Forge & Tool Wks., Allentown, Pa.
Electric—Pipe cleaning machines. Spartan Tool Co., Chicago, Ill.
Electric Filter Watchman—Gages. Herbusch Corp., The, St. Louis, Mo.
Electric Trimline Baseboard—Radiators. Vulcan Radiator Co., Hartford, Conn.
Electrifugal—Centrifugal pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Electroflo—Valves. Hays Mfg. Co., Erie, Pa.
Electro-Hot—Heaters. Red Spot Electric Co., Tacoma, Wash.
Electromaze—Air filters. Air-Maze Corp., Cleveland, O.
Electro-Mesurflo—Valves. Hays Mfg. Co., Erie, Pa.
Electromite—Valves. Hays Mfg. Co., Erie, Pa.
Electro-Rod—Pipe cleaning machines. Spartan Tool Co., Chicago, Ill.
Electro-Sheet—Sheets. American Brass Co, Waterbury, Conn.
Electroweld—Welders. Electric Arc, Inc., Newark, N. J.
Electro-Wind—Ventilators. Allen Cooler & Ventilator Inc., Rochester, Mich.
Electrunite—Stainless steel tubing and pipe. tubing benders. Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Elesco—Superheaters. Combustion Engineering, Inc., New York, N. Y.
Elgex—Steam system treatment. Elgin Softener Corp., Elgin, Ill.
Elgin—Arc welders. Borm Mfg. Co., Elgin, Ill.
Elgin—Louvers and shutters. Elgo Shutter & Mfg. Co., Detroit, Mich.
ELKonite—Welders. Mallory Co., P. R., The, Indianapolis, Ind.
ELKonium—Welders. Mallory Co., P. R., The, Indianapolis, Ind.
Elm—Dampers. Elgo Shutter & Mfg. Co., Detroit, Mich.
Elno—Electrolytic devices. Cleveland Heater Co., Cleveland, O.
Emd-Com—Blowers. Wing Mfg. Co., L. J., Linden, N. J.
Empire—Refractories and refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Empire—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Empire Mallets—Tools. Greene, Tweed & Co., North Wales, Pa.
Enamelite—Coatings. Presstite-Keystone Engineering Products Co., A Div. of American-Marietta Co., St. Louis, Mo.
Enco—Burners, regulators, registers, combustion control systems, fueloil units. Engineer Co., New York, N. Y.
Enduro—Hose. Continental Rubber Wks., Erie, Pa.
Enduro—Steel tubing, pipe. Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Enduro#300—Unions. Jefferson Union Co., Inc., New York, N. Y.
Entrained Combustion—Gas Burners. Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Equalizer—Deaerators, feeders, systems, traps. Acker Corp., Meridian, Miss.
Equatemp—Balancing valves. Ohio Brass Co., Mansfield, O.
Equa-Trol—Valves, manifolds and headers. Hi-Flow Products, Inc., Copiague, N. Y.
Equavalve—Pipe fittings & Valves. Hi-Flow Products, Inc.. Copiague, N. Y.
Eraydo—Zinc sheets. Illinois Zinc Co., Div. of Hydrometals, Inc., Chicago, Ill.
Ermeto—Fittings. Weatherhead Co., The, Ft. Wayne Div., Ft. Wayne, Ind.
Eroduct—Insulation. Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Esco—Fittings, flanges, nipples, pipe, exchangers. Electric Steel Foundry Co., Portland, Ore.
Esco Spuncast—Pipe, tubing. Electric Steel Foundry Co., Portland, Ore.
Esso—Oil burners, heaters, air conditioning units, furnaces, boilers. Gilbert & Barker Mfg. Co., West Springfield, Mass.
Esso Bond—Refractories. Ramtite Co., The, Chicago, Ill.
Eternium—Protective coatings. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Eutec-Arc—Arc welders. Eutectic Welding Alloys Corp., Flushing, N. Y.
EuteChron—Welding electrodes, gas welding rod. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutec Rod—Rods, solder. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutec-Tin-Weld—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutecto Film—Gas welding rod. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutecto-Mask—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Eutector Flux—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
EutecTorch—Torches, welding and cutting apparatus. Eutectic Welding Alloys Corp., Flushing, N. Y.
EutecTrode—Welding electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
EVACTOR—Heaters and pumps. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Evanaction—Valves. Taylor Instrument Companies, Rochester, N. Y.
Eveco—Controls. Empire Ventilation Equipment Co., Long Island City, N. Y.
Everbrite—Paint. Warren Refining & Chemical Co., The, Cleveland, O.
Everdri—Sump pumps. Wade Mfg. Co., Elgin, Ill.
Everjet—Coatings. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Evolene—Treatment. Berna Corp., Garwood, N. J.
Exactol—Benders. Parker Appliance Co., The, Cleveland, O.
Excell 250#—Unions. Jefferson Union Co., Inc., New York, N. Y.
Exon—Plastics, powders and resins. Chemical Sales Div., Firestone Plastics Co., Pottstown, Pa.
Expand-R-Strap—Fasteners. Gerrard & Co., A. J., Melrose Park, Ill.
Expandzorber—Joints. Finn & Co., Inc., T. R., Hawthorne, N. J.
Expelsor—Ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Explosimeter—Leak detectors. Mine Safety Appliances Co., Pittsburgh, Pa.
Extra Dry Esotoo—Refrigerants. Virginia Smelting Co., West Norfolk, Va.
Eye-Hye—Indicators. Reliance Gauge Column Co., Cleveland, O.
Ez-Arc—Arc welders. Will-Weld Mfg. Co., Inc., Omaha, Neb.
Ezkleen—Filters. Research Products Corp., Madison, Wis.
Ezy-Kleen—Strainers. Blackmer Pump Co., Grand Rapids, Mich.

F & E—Stokers, and incinerators. Flynn & Emrich Co., Baltimore, Md.
FMI Particulate—Air filters. Flanders Mill, Inc., Riverhead, Long Island, N. Y.
F. P. Fabricated Plate—Capacitors. Mallory Co., P. R., The, Indianapolis, Ind.
FS—Bellows. Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Fabri-Flex—Bases and pads. Vibration Mountings, Inc., Corona, N. Y.
Fabrikated—Grilles, registers. Independent Register Co., Cleveland, O.
Faceweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Fairco Braze—Valves. Fairbanks Co., The, New York, N. Y.
Fan-Air—Gas burners. Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.

Fanjet—Systems. Muellermist Irrigation Co., Maywood, Ill.
Fanmix—Burners. Coppus Engineering Corp., Worcester, Mass.
Far-Air—Air conditioning units, filters, humidifiers. Farr Co., Los Angeles, Calif.
Farragut—Packing. Darcoid Co., Inc., New York, N. Y.
FasFill—Connectors. Scully Signal Co., Melrose, Mass.
Fashion—Thermostats. White-Rodgers Co., St. Louis, Mo.
Faslite—Gas pilots. Scully Signal Co., Melrose, Mass.
Fast's—Couplings. Koppers Company, Inc., Metal Products Div., Baltimore, Md.
FauceHot—Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Favorite—Ratchet wrenches. Greene, Tweed & Co., North Wales, Pa.
Featherfin—Heating and cooling surface, unit coolers. Wing Mfg. Co., L. J., Linden, N. J.
Featherweight—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Featherweight—Unit heaters. Wing Mfg. Co., L. J., Linden, N. J.
Featherweight Champ—Pipe cutting and threading machines, pipe vise stands. Oster Mfg. Co., Cleveland, O.
Federal—Filters. Wood Mfg. Co., A. R., Luverne, Minn.
Feedrator—Chemical feeders. Fischer & Porter Co., Hatboro, Pa.
Fel-Pro—Gaskets, packing. Felt Products Mfg. Co., Chicago, Ill.
Felt Grip—Bases and pads. Vibration Mountings, Inc., Corona, N. Y.
Fenn's Rotary—Ventilators. Waverly Heating Supply Co., Boston, Mass.
Ferrenewo—Valves. Lunkenheimer Co., Cincinnati, O.
Ferro-Therm—Insulation. American Flange & Mfg. Co., Inc., New York, N. Y.
Ferroweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Ferulok—Fittings. Parker Appliance Co., The, Cleveland, O.
Fiberglas—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.
Fiberlite—Insulation. Insulite Co., Minneapolis, Minn.
Fibrocel—Pipe insulation. Johns-Manville, New York, N. Y.
Fieldlink—Fittings. LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Fil-Thru—Gages. Applied Mechanics Co., Boston, Mass.
Filtr-Aire—Filters. Peden Equipment Co., Houston, Tex.
Filtrex—Filters. Drico Industrial Corp., Passaic, N. J.
Filt-R-Stil—Water treatment. American Cyanamid & Chemical Corp., New York, N. Y.
Fine-Screen—Strainers. Yarnall-Waring Co., Philadelphia, Pa.
Fin-Flex—Registers. Auer Register Co., Cleveland, O.
Finger Strap—Fasteners. Gerrard & Co., A. J., Melrose Park, Ill.
Finnflex—Bases, hangers. Finn & Co., Inc., T. R., Hawthorne, N. J.
Fin Ray—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Fin Vector—Radiation. Dunham-Bush, Inc., West Hartford, Conn.
Fire Belle—Alarms. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Firecrete—Refractories. Johns-Manville, New York, N. Y.
Firefoil—Insulating panel. Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Fire-Hearth—Refractories. Insul-Lyte Corp., A Div. of Plibrico Co., River Rouge, Mich.
Fireite—Furnace cement, refractories. Johns-Manville, New York, N. Y.
Fire Jet—Stokers. Electric Furnace-Man, Inc., Emmaus, Pa.
Fireline—Refractories and refractory cement. Insul-Lyte Corp., A Div. of Plibrico Co., River Rouge, Mich.
Firelite—Refractories and refractory cement. Insul-Lyte Corp., A Div. of Plibrico Co., River Rouge, Mich.
Firevalve—Ventilators. Swartwout Co., Cleveland, O.
Fireye—Alarms, flame failure controls, recorders, combustion control systems, valves. Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.
Firite—Stokers. Hoffman Combustion Engineering Co., Lincoln Park, Mich.
Firma—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Firomatic—Filters, cut-offs, gages, links, switches, valves. Morse-Smith-Morse, Inc., Watertown, Mass.
Fitrite—Tools, roof ventilators. Levow, David, New York, N. Y.
Fixt-Aire—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
Flame-o-trol—Controls. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Flange-Jacks—Separators. Williams & Co., J. H., Buffalo, N. Y.
Flat-Belt—Pulleys and sheaves. The American Pulley Co., Philadelphia, Pa.
Fleet Line—Motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Fleetweld—Welding electrodes. Lincoln Electric Co., Cleveland, O.
Flex—Nipples. Techniflex Corp., Port Jervis, N. Y.
Flexarc—Arc Welders. Westinghouse Electric Corp., Pittsburgh, Pa.
Flexazone—Air conditioning units. National-U.S. Radiator Corp., The, Johnstown, Pa.
Flexazone—Air conditioning units. Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
Flexcell—Bases and pads. Celotex Corp., The, Chicago, Ill.
Flexfast—Hose clamps. Flexible Tubing Corp., Guilford, Conn.
Flexfelt—Insulation. National Gypsum Co., Buffalo, N. Y.
Flexflyte—Ducts and duct fittings, hose, tubing. Flexible Tubing Corp., Guilford, Conn.
Flexiblac—Protective coatings. Samuel Cabot, Inc., Boston, Mass.
Flexible Line—Fittings, hose. Dole Refrigerating Co., Chicago, Ill.
Flexibond—Protective coatings. Continental Products Co., Euclid, O.
Flexi-Duct—Connections. Grant Wilson, Inc., Chicago, Ill.
Flexidur—Nozzles. Bahnson Co., Winston-Salem, N. C.
Flexidyne—Couplings, drives. Dodge Mfg. Corp., Mishawaka, Ind.
Flexiflo—Diffusers. Universal Diffuser Corp., Tuckahoe, N. Y.
Flex-I-liner—Rotary pumps. Vanton Pump & Equipment Corp., Hillside, N. J.
Flexitite—Gate valves. Ohio Brass Co., Mansfield, O.
Flexloc—Lock nuts. Standard Pressed Steel Co., Jenkintown, Pa.
FLEXODISC—Expansion joints. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
FLEXOLEED—Expansion joints. Croll-Reynolds Engineering Co., Inc., New York.
Flexon—Bellows, pipe joints, ducts and duct fittings. Flexonics Corp., Maywood, Ill.
Flexon Expansion Compensator—Pipe joints. Flexonics Corp., Maywood, Ill.
Flexpansion—Fittings and hose. Techniflex Corp., Port Jervis, N. Y.
Flexpin—Couplings. Smith & Serrell, Inc., Newark, N. J.
FlexRing—Couplings. Smith & Serrell, Inc., Newark, N. J.
Flex-Seal—Pumps. Bart Mfg. Corp., Belleville, N. J.
Flextan—Packing. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Flex-Tube—Analyzers, gages, kits, meters, testers, manometers, switches, pitot tubes. Dwyer Mfg. Co., F. W., Michigan City, Ind.
Flex Valve—Valves. Farris Flexible Valve Corp., Palisades Park, N. J.
Flo—Dehydrant and acid neutralizer, for refrigerating systems. Allin Mfg. Co., Chicago, Ill.
Floatrol—Switches, regulators. Automatic Control Co., St. Paul, Minn.
Flochek—Valves. Taco Heaters, Inc., Cranston, R. I.
Flo-Coater—Booths. Griffin & Co., Louisville, Ky.
Flocold—Unit coolers. Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
Floguide—Flow meters. Fischer & Porter Co., Hatboro, Pa.
Flo-Klean—Filters. Cuno Engineering Corp., Meriden, Conn.
Flo-Line—Valves. Hanna Engineering Wks., Chicago, Ill.
Flo-Master—Louvers and shutters. Acme Equipment Co., Muskogee, Okla.
Flo-Matic—Conveyors, stokers. American Coal Burner and Wood Stoker Corp., Chicago.
Floor-Level—Radiation. Rempe Co., Chicago.
Florite—Air velocity meters, and anemometers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Florite Desiccant—Dehumidifiers, dehydrators. Floridin Co., Tallahassee, Fla.
Flo-Scope—Meters. Selas Corp. of America, Dresher, Pa.
Flotectic Flux—Welding compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Flo-Tee—Fittings. Hi-Flow Products, Inc., Copiague, N.Y.
Flotrol—Humidifiers, valves. Cleveland Humidifier Co., Cleveland, O.
Flo-Tube—Conveyors. Canton Stoker Corp., Canton, O.
Flo-watch—Flow meters. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Flow-Cold—Water chillers, compressors, coolers and towers. Acme Industries, Inc., Jackson, Mich.
Flowline—Pipe fittings, flanges. Welding Fittings Corp., New Castle, Pa.
Flowmaster—Pumps. Marco Co., Inc., Saginaw, Mich.
Flow-Mizer—Cooling towers, condensers. Acme Industries, Inc., Jackson, Mich.
Flow-Pac—Chillers, compressors. Acme Industries, Inc., Jackson, Mich.
Flowrator—Meters, systems. Fischer & Porter Co., Hatboro, Pa.
Flow-Temp—Air conditioning Units. Acme Industries, Inc., Jackson, Mich.
Flow-Therm—Chillers, compressors, coolers. Acme Industries, Inc., Jackson, Mich.
Flow Tube—Meters. Foster Engineering Co., Union, N. J.
Fluid Fortress—Fittings. Flodar Corp., Cleveland, O.
Fluid Joists—Coils. Fricke, Fred J., Albuquerque, N. M.
Fluidyne—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Fluid-Tite—Pipe, asbestos. Keasbey & Mattison Co., Ambler, Pa.
Fluoroflex—Tubing. Resistoflex Corp., Roseland, N. J.
Fluoroseal—Cement and compounds. Industrial Plastic Fabricators, Norwood, Mass.
Flush-Kleen—Sewage ejectors and pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Flux-'N-Solder—Solder. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Foamglas—Insulation. Pittsburgh Corning Corp., Pittsburgh, Pa.
Foamglas—Insulation. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Force-Flo—Circulators, fittings, heaters, regulators, tanks. Kehm Corp., The, Chicago.
Force-Flo—Unit heaters. Trane Co., The, LaCrosse, Wis.
Form-A-Gasket—Cement and compounds. Permatex Co., Inc., Brooklyn, N. Y.
Form-A-Jig—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.
Formet—Water treatment. Perolin Co., Inc., New York, N. Y.
Fosco—Water heaters. Schoedinger, Inc., F. O., Columbus, O.
4-Star—Adhesive tape. Johns-Manville, New York, N. Y.
Fracto Crete—Refractories. Ramtite Co., The, Chicago, Ill.
Francite—Cement, refractories and refractory cement. France Refractories Co., J. H., Snow Shoe, Pa.
Francke—Flexible couplings. Waldron Corp., John, New Brunswick, N. J.
Francke Parts—Couplings. Smith & Serrell, Inc., Newark, N. J.
Franco-Therm—Cement, insulating. France Refractories Co., J. H., Snow Shoe, Pa.
Franset—Cement, refractories and refractory cement. France Refractories Co., J. H., Snow Shoe, Pa.
Free-Aire—Air conditioning units, heaters. Kehm Corp., The, Chicago, Ill.
Free-Flow—Ventilators. Burt Mfg. Co., Akron, O.
Fre-Flow—Strainers. Fisher Governor, Marshalltown, Ia.
Freon—Refrigerants. E. I. du Pont de Nemours & Co., Inc., "Kinetic" Chemical Div., Wilmington, Del.
Frigid Arc—Welding electrodes. Eutectic Welding Alloys Corp., Flushing, N.Y.
Frigistat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Frogalloy—Electrodes. McKay Co., Pittsburgh, Pa.
Frost-Tite—Fittings. Remco, Inc., Zelienople, Pa.
Fuelguard—Regulators. Ashcraft Co., J. P., Dallas, Tex.
Fuel Saver—Boilers. International Boiler Works Co., The, East Stroudsburg, Pa.
Fuel Saver—Regulators. Nichols Instruments Co., Baltimore, Md.
Fuelsaver—Controls, regulators. Walker Mfg. & Sales Co., St. Joseph, Mo.
Fueltone X-10—Fuel oil treatment. Ampion Corp., Long Island City, N. Y.
Fuel-tron—Fuel oil treatment. Radiator Specialty Co., Charlotte, N. C.
Fulflo—Filters. Commercial Filters Corp., Melrose, Mass.
Fulgrip—Pulleys and sheaves. Maurey Mfg. Corp., Chicago, Ill.
Fulljet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Full-view—Meters. Brooks Rotameter Co., Lansdale, Pa.
Fulscope—Recorders, recorder-controllers, regulators. Taylor Instrument Companies, Rochester, N. Y.
Fuseair—Air diffusers. Aladdin Heating Corp., San Leandro, Calif.
Fusionwell—Tubing. Avon Tube Div., Highbe Mfg. Co., Rochester, Mich.
Fybr-Tech—Gaskets and sheets. Technical Ply-Wood Sales, Chicago, Ill.
Fyr-Feeder—Stokers. American Coal Burner and Wood Stoker Corp., Chicago, Ill.
Fyrite—Analyzers, combustion testing kits. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Fyrite—Recorders. Cole-Sewell Engineering Co., St. Paul, Minn.

G. B. C.—Gages, fans. Bate Soot Blower Div., General Blower Co., Inc., Philadelphia, Pa.
G-B Snap-On—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
G-Fin—Cooling and heating surface, tubing. Griscom-Russell Co., Massillon, O.
GIL—Filters, regulators, valves. Gas & Oil Industry Laboratories, Inc., Irvington, N.J.
GIL Governoret—Valves. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
G-K—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.
G-R—Aftercoolers, oil coolers, water chillers, exchangers. Griscom-Russell Co., Massillon, O.
GS—Anemometers, hygrometers, indicators, psychrometers, welding and cutting apparatus. General Scientific Equipment Co., Philadelphia, Pa.
GT—Shaft Seals. Greene, Tweed & Co., North Wales, Pa.
Gaco—Pipe fittings, hard rubber pipe. Gates Engineering Co., Wilmington, Del.
Gaco-Neoprene & Rubber—Valves, coatings, fittings, pipe. Gates Engineering Co., Wilmington, Del.
Gaco-Neoprene Vinyl—Coatings. Gates Engineering Co., Wilmington, Del.
Gagetron—Regulators. Instruments, Inc., Tulsa, Okla.
Galbestos—Sheet metal. Robertson Co., H. H., Pittsburgh, Pa.
Galongage—Gages. Applied Mechanics Co., Boston, Mass.
Galva-Lux—Enamels and lacquers. Acorn Paint and Chemical Co., Cleveland, O.
Gascope—Leak detectors. Mine Safety Appliances Co., Pittsburgh, Pa.
Gas-A-Fire—Burners. Automatic Corp., St. Louis, Mo.
Gask-O-Seal—Seals and gaskets. Wolfe Co., Inc., The Franklin C., Culver City, Calif.
Gas-O-Matic—Gas burners. Williams Div., Eureka Williams Corp., Bloomington, Ill.
Gas Pak—Welding rod. Marquette Mfg. Co., Inc., Minneapolis, Minn.
Gast—Separators. Johnson Corp., The, Three Rivers, Mich.
Gasteam—Radiators. Clow & Sons, Inc., James B., Chicago, Ill.
Gasweld—Torches, meters, valves, welders, regulators, welding rod and apparatus. Liquid Carbonic Corp., The, Chicago, Ill.
GearMotoRs—Gears. Philadelphia Gear Works, Inc., Philadelphia, Pa.
Gemco—Bolts, clamps, hangers and supports, nuts and washers, fasteners. Goodloe E. Moore, Inc., Danville, Ill.
Gemware—Hygrometers, psychrometers, thermometers, recorders, switches. G. M. Mfg. Co., New York, N. Y.
Gentile—Meters. Foster Engineering Co., Union, N. J.
Genuine Stillson—Wrenches. Walworth Co., New York, N. Y.
Geometric—Chasers. Greenfield Tap & Die Corp., Greenfield, Mass.
Geon—Plastics. Goodrich Chemical Co., B. F., Cleveland, O.
Gilbarco—Compressors, air conditioning units, boilers, cement and compounds, furnaces, oil burners heaters, pumps. Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilmer—V-belts, v-belt drives. New York Belting & Packing Co., Passaic, N. J.
Gilsonite—Protective coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.
Gilt Edge—Belting. Rhoads & Sons, J. E., Wilmington, Del.
Gland-Pakt—Expansion joints. Yarnall-Waring Co., Philadelphia, Pa.
Glassheat—Conductors and panels. Continental Radiant Glass Heating Corp., New York, N. Y.
Glazecoat—Building insulation. Johns-Manville, New York, N. Y.
Glo Tech—Glass pipe. Fischer & Porter Co., Hatboro, Pa.
Glowan—Gas burners. Martin Co., Inc., J. O., San Francisco, Calif.
Glow-Top—Burners. Gordon & Piatt, Inc., Winfield, Kans.
Glycosol—Sterilizing units. Glycolator Sales & Service, Pittsburgh, Pa.
Goetze—Gaskets. Johns-Manville, New York, N. Y.
Gold Bond #340—Insulation. National Gypsum Co., Buffalo, N. Y.
Good—Pumps. Goodfellow Co., Inc., E. D., Memphis, Tenn.
Goodyearite—Packing. Goodyear Tire & Rubber Co., Akron, O.
Grad-U-Motor—Damper operators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Gradustat—Regulators, thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Gradutrol—Diaphragm valves, radiator orifices. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Graham—Valves. Texsteam Corp., Houston, Tex.
Granco—Meters, pumps, strainers. Granberg Corp., Oakland, Calif.
Grand Rapids—Boiler vacuum cleaners. Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Granodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Granodraw—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Graycote—Cement and compounds. Chicago Gasket Co., Chicago, Ill.
Greastop—Air filters. Air-Maze Corp., Cleveland, O.
Great Seal—Gaskets, packing, tape, valves. New York Belting & Packing Co., Passaic, N. J.
Greenspot—Hose clamps. Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Greyhound—Welders. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Grid—Unit coolers, finned surfaces, radiation, unit heaters, humidifiers. Murray Mfg. Co., D. J., Wausau, Wis.
Griptube—Fittings. Flodar Corp., Cleveland.
Gripzins—Expansion bolts. Star Expansion N. Y., Inc., New York, N. Y.
Gritseald—Rotary pumps. St. Louis Tool Co., St. Louis, Mo.
Gruvagrip—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Gruvajoint—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Guardian—Oil tank gages. Applied Mechanics Co., Boston, Mass.
Guillotine—Cutters, pipe cutting and threading machines. Wachs Co., E. H., The, Chicago, Ill.
Gunchrome—Refractories and refractory cement. Basic Inc., Cleveland.
Gundol—Refractories and refractory cement. Basic Inc., Cleveland, O.
Gun Mix—Refractories and refractory cement. Basic Inc., Cleveland, O.
Gun Pakt—Expansion joints. Yarnall-Waring Co., Philadelphia, Pa.
Gyro Mass Meter—Meters. Norwood Controls, A Unit of Detroit Controls, Norwood, Mass.
Gyrol—Drives. American Blower Corp., Detroit, Mich.
Gyrol Fluid Drive—Speed changer. American Blower Corp., Detroit, Mich.

H & C—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
HH&HHV—Air conditioning units. Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
HS—Fans. American Blower Corp., Detroit.
HX-Changers—Heat exchangers. Rempe Co., Chicago, Ill.
Hallowell—Bearings. Standard Pressed Steel Co., Jenkintown, Pa.
Hammerkraft—Enamels and lacquers. Hilo Varnish Corp., Div. of Carpenter-Morton Co., Everett, Mass.
Hammerlin—Coatings, enamels. Interchemical Corp., Finishes Div., Newark, N. J.
Hammermill—Belting. Goodyear Tire & Rubber Co., Akron, O.
Hamrflute—Drills. Star Expansion N. Y., Inc., New York, N. Y.
Hamrtwist—Drills. Star Expansion N. Y., Inc., New York, N. Y.
Hancock—Valves. Manning, Maxwell & Moore, Inc., Stratford, Conn.
Hand O Matic—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Handy—Valves. Allin Mfg. Co., Chicago, Ill.
Handy—Benders. Holsclaw Bros., Inc., Evansville, Ind.
Handy—Valves. Lunkenheimer Co., Cincinnati, O.
Handy Andy—Vise stands. Western Wire Products Co., St. Louis, Mo.
Handy-Flux—Solder. Handy & Harman, New York, N. Y.
Hartmann—Heaters. Montgomery Bros., San Francisco, Calif.
Hazleton—Pumps, strainers, valves. Barrett Haentjens & Co., Hazleton, Pa.
Heath-Crete—Refractories. Quigley Co., Inc., New York, N. Y.
Hearth patch—Refractories and refractory cement. Basic Inc., Cleveland, O.
Heart-Oak—Belting. Graton & Knight Co., Inc., Worcester, Mass.
Heat-aid—Refractories. Pyrolite Products Co., Cleveland, O.
Heat-Cel—Hot gas defrosting systems. Dole Refrigerating Co., Chicago, Ill.
Heatcote—High temperature paint. Debevoise Co., The, Brooklyn, N. Y.
Heat-Crete—Concrete densifiers. Products Planning Co., Pittsburgh, Pa.
Heatflex—Cables, heaters. S&C Mfg. Co., Cincinnati, O.
Heat-Hog—Coolers. Heatron, Inc., York, Pa.
Heatmaster—Heaters. Coleman Co., Inc., The, Wichita, Kans.
Heat-Pak—Boilers, heaters. Aldrich Co., The, Wyoming, Ill.
Heatrim—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Heat-Rite—Registers. Auer Register Co., Cleveland, O.
Heatsaver—Systems. Advance Pump Co., Berkeley, Calif.
Heatsum—Conductors, cable. Roberson Co., L. N., Seattle, Wash.
Heat-Valve—Ventilators. Swartwout Co., The, Cleveland, O.
Heat Wagon—Heaters. Lennox Industries, Inc., Marshalltown, Ia.
Heavy Duty—Pipe cutters. Erie Tool Works, Erie, Pa.
Heavy Duty—Pipe wrenches. Ridge Tool Co., Elyria, O.
Heilex—Tanks. Heil Process Equipment Corp., Cleveland, O.
Heliarc—Welders. Research Vacuum Supply Co., Chicago, Ill.
Heliflow—Aftercoolers, chillers, oil coolers, heat exchangers, water heaters. Graham Mfg. Co., Inc., New York, N. Y.
Hellite—Refractories. Johns-Manville, New York, N. Y.
Herco—Arc welders. Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Hercules—Floats. Henry Owens & Co., Inc., Cranston, R. I.
Herculite—Tanks. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Herculoy—Tubing. Revere Copper and Brass, Inc., New York, N. Y.
Herecrol—Protective Coatings, tank linings, lined pipe. Heresite & Chemical Co., Manitowoc, Wis.
Hev-E-Gas—Burners. Cleaver-Brooks Co., Milwaukee, Wis.
Hev-E-Oil—Burners. Cleaver-Brooks Co., Milwaukee, Wis.
Hex-Changer—Heat Exchangers. Drayer-Hanson, Division of National-U. S. Radiator Corp., Los Angeles, Calif.
Hex-Tex—Belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Hi—Bolts, clamps, cleaners, drills, insulation fasteners, pipe hangers and supports, pipe reamers. Holub Industries, Inc., Sycamore, Ill.
Hi-Amp—Tools. Lenco, Inc., Jackson, Mo.
Hi-Cap—Furnaces. Syncromatic Corp., Watertown, Wis.
Hidden Heat—Coils and panels. Hi-Flow Products, Inc., Copiague, N. Y.
Hideaway—Air conditioning units. Burnham Corp., Irvington, N. Y.
Hideway—Cooling towers. Toungate & Coats, Austin, Tex.
Hi-Duty—Tubing cutters, fittings, shafts, flaring tools. Imperial Brass Mfg. Co., Chicago.
Hi-Duty—Combustion chambers. Monogram Products Co., Inc., Philadelphia, Pa.
Hi-Ef—Filters, heads, separators. Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
Hi-Ex—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.
Highflex—Belting. Goodrich Co., B. F., Akron, O.
High Heat Aluminum—Paint. Valdura Div., American-Marietta Co., Chicago, Ill.
High Heat Gray—Paint. Valdura Div., American-Marietta Co., Chicago, Ill.
High - Ten - 500—Solder. Industrial Service Laboratories, Milwaukee, Wis.
Hilco—Filters. Hillard Corp., Elmira, N. Y.
Hilger—Chillers, unit coolers, unit air conditioners, valves. XL Refrigerating Co., Chicago, Ill.
Hi-Lift—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Hi-Lo—Alarms. Yarnall-Waring Co., Philadelphia, Pa.
Hi-Lo—Pumps. Yeomans Bros. Co., Melrose Park, Ill.
Hi-Lo-Graph—Recorders. Yarnall-Waring Co., Philadelphia, Pa.
Hi-Peak—Water chillers. Acme Industries, Inc., Jackson, Mich.
Hirae—Heaters. Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Hi-Seal—Cement and compounds. Greene, Tweed & Co., North Wales, Pa.
Hi-Speed—Welding and cutting apparatus, torches. Dockson Corp., Detroit, Mich.
Hitchings—Boilers. Burnham Corp., Irvington, N. Y.
Hi - Temp—Insulation. Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Hi-Temp—Insulation cement, refractories & refractory cement. Zonolite Co., Chicago, Ill.
Hi-Temp—Paint. Illinois Bronze Powder Co., Chicago, Ill.
Hi-Value—Adhesive tape. Johns-Manville, New York, N. Y.
Hoffman—Heaters. Clayton & Lambert Mfg. Co., Louisville, Ky.
Hoffman—Draft controls. Salina Metal Products Co., Salina, Kan.
Hole-Shooter—Drills. Milwaukee Electric Tool Corp., Milwaukee, Wis.
Holgun—Drills. Black & Decker Mfg. Co., Towson, Md.
Hollo-Tech—Doors and panels. Technical Ply-Wood Sales, Chicago, Ill.
Holly—Benders. Griffith Equipment Co., Inc., Los Angeles, Calif.

Holoflite—Dryers. Western Precipitation Corp., Los Angeles, Calif.

Holt—Strainers, tube cleaners. Rosedale Foundry & Machine Co., Pittsburgh, Pa.

Holtite—Bolts, screws. Continental Screw Co., New Bedford, Mass.

Holtite—Clamps. Yarnall-Waring Co., Philadelphia, Pa.

Honeycomb—Filters. Wilson & Co., Inc., Chicago, Ill.

Horizontal Remotaire—Air conditioning units. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Horton—Tanks. Chicago Bridge & Iron Co., Chicago, Ill.

Hot Shot—Unit coolers. Drayer-Hanson, Division of National-U. S. Radiator Corp., Los Angeles, Calif.

Hot Spot—Preheaters. Rempe Co., Chicago.

Hot Spot—Spot welders. Acme Electric Welder Co., Los Angeles, Calif.

Houghto-Clean—Boiler cleaning compounds. Houghton & Co., E. F., Philadelphia, Pa.

Hovalco—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.

Howlers—Alarms. Benjamin Electric Mfg. Co., Des Plaines, Ill.

Hoze-Lok—Fittings, hose. Parker Appliance Co., The, Cleveland, O.

Humiclean—Cleaning compounds, water treatment. Carolina Aniline & Extract Co., Charlotte, N. C.

Humidair—Humidifiers. Skilbeck Mfg. Co., Kenosha, Wis.

Humidigraph—Humidistats, hygrometers, indicator-controllers. Bristol Co., Waterbury, Conn.

Humidiguide—Hygrometers. Talyor Instrument Companies, Rochester, N. Y.

Humidomist—Nozzles, humidifiers. Supreme Electric Products Corp., Rochester, N. Y.

Humidostat—Humidistats. Johnson Service Co., Milwaukee, Wis.

Humiduct—Unit air conditioners. Bahnson Co., Winston-Salem, N. C.

Humid - U - Stat—Humidistats. Minneapolis-Honeywell Regulator Co., Minneapolis.

Humistat—Humidistats. American Instrument Co., Inc., Silver Spring, Md.

Humi-Temps—Unit air coolers. Larkin Coils, Inc., Atlanta, Ga.

Hum-O-Zone—Room type humidifiers. Hermidifier Co., Neffsville, Pa.

Humphrey—Heaters. General Gas Light Co., Kalamazoo, Mich.

Huron—Baseboard radiation. Farrell Associates, Charles, Valencia, Pa.

HusHeater—Heaters. Sims Pump Valve Co., Hoboken, N. J.

Hydralt—Protective coatings. Flintkote Co., The, New York, N. Y.

Hydramotor—Valves. General Controls Co., Glendale, Calif. and Skokie, Ill.

Hydra-Spray—Booths. Griffin & Co., Louisville, Ky.

Hydra-Tube—Dust collectors. Newcomb-Detroit Co., Detroit, Mich.

Hydrecon—Combustion chambers. France Refractories, Co., J. H., Snow Shoe, Pa.

Hydrepair—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.

Hydro—Recorders. Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Hydro-Fin—Radiation. Hydrotherm, Inc., Northvale, N. J.

Hydro-Flo—Heaters, heating systems, circulators, regulators. Bell & Gossett Co., Morton Grove, Ill.

Hydro-Foam—Dust collectors. Mahon Co., R. C., Detroit, Mich.

Hydro-Foil—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.

Hydroline—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.

Hydro-Lok—Regulators, valves. American Flow Control Corp., Houston, Tex.

Hydro-Matic—Connectors. Mechanical Products Corp., Chicago, Ill.

Hydron—Bellows. Clifford Mfg. Co., Div. of Standard-Thompson Corp., Waltham, Mass.

Hydro-Pak—Chillers. Hydrotherm, Inc., Northvale, N. J.

Hydro-Precipitator—Washers. Johnson-March Corp., Philadelphia, Pa.

Hydro-Whirl—Dust collectors, spray booths. Peters-Dalton, Inc., Detroit, Mich.

Hydryer—Dehumidifiers. Pritchard & Co. of California, J. F., Kansas City, Mo.

Hy-Duty—Blades, propeller fans. Schwitzer Corp., Indianapolis, Ind.

Hygrodial—Indicators and recorders. Abbeon Supply Co., Jamaica, N. Y.

Hygrodial—Indicators. Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.

Hyrate—Refractories. Plibrico Co., Chicago, Ill.

Hyro—Regulators. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.

Hy-Temp—Cement, insulation. Keasbey & Mattison Co., Ambler, Pa.

Hytempite—Cement, refractories. Quigley Co., Inc., New York, N. Y.

Hy-Test—Heaters. Burnham Corp., Irvington, N. Y.

Hy-Test—Water heaters. Smith Co., Inc., H. B., The, Westfield, Mass.

Hy-Vent—Eliminators. Taco Heaters, Inc., Cranston, R. I.

IMO—Pumps. De Laval Steam Turbine Co., Trenton, N. J.

IVCO—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

Ice-Cel—Accumulators, chillers. Dole Refrigeration Co., Chicago, Ill.

Icy-Flo—Accumulators. McQuay, Inc., Minneapolis, Minn.

Ideal—Tools. Boston Machine Works, Co., Lynn, Mass.

Ideal—Traps. Nason Co., Clarkston, Mich.

Idealarc—Welders. The Lincoln Electric Co., Cleveland, O.

IllBronze—Paint. Illinois Bronze Powder Co., Chicago, Ill.

Illco-Way—Water filters, ionization apparatus, water softeners, water treatment. Illinois Water Treatment Co., Rockford, Ill.

Immersatherm—Thermostats. Mercoid Corp., The, Chicago, Ill.

Imperial—Air conditioning units. International Metal Products Co., Phoenix, Ariz.

Imperial—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.

Impervo—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.

Impulse—Traps. Yarnall-Waring Co., Philadelphia, Pa.

Inco—Electrodes, flanges, pipe fittings, pipe, rod, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.

Inconel—Pipe, fittings, flanges, pipe, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.

Inconel—Tubing. Trent Tube Co., East Troy, Wis.

Indeeco—Heaters, preheaters, pipe heating systems. Industrial Engineering & Equipment Co., St. Louis, Mo.

Indestructible—Gaskets. New York Belting & Packing Co., Passaic, N. J.

Indoor-Outdoor—Thermostats. White-Rodgers Co., St. Louis, Mo.

Industrial Air—Furnaces, heaters. Inland Heater Corp., Minneapolis, Minn.

IngAclad—Clad sheets. Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill.

In-Line—Reducers and increasers. Link-Belt Co., Chicago, Ill.

Ins-Lite—Insulation. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.

Inspecdor—Doors and panels. Zurn Mfg. Div., A. J., Zurn Industries, Inc., Erie, Pa.

Instant—Heaters, preheaters. Johnson Corp., The, Three Rivers, Mich.

Instant Glo—Combustion chambers. Boston Machine Works Co., Lynn, Mass.

Instant-Hardner—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y.

InstOmatic—Couplings. Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.

Insulag—Insulation, cement. Quigley Co., Inc., New York, N. Y.

Insulation—Protective coatings. Minnesota Mining & Mfg. Co., St. Paul, Minn.

Insulbrix—Refractories. Quigley Co., Inc., New York, N. Y.

Insulcolor—Vapor barriers. Armstrong Cork Co., Lancaster, Pa.

Insulcrete—Refractories. Quigley Co., Inc., New York, N. Y.

Insulerex—Refractories. Quigley Co., Inc., New York, N. Y.

Insulfil—Insulation. Miracle Adhesives Corp., Bellmore, N. Y.

Insulfil—Insulation. Refractory & Insulation Corp., New York, N. Y.

Insulkote—Boiler and tank insulation. Johns-Manville, New York, N. Y.

Insul-Pin System—Insulation fasteners and welders. Graham Mfg. Corp., Royal Oak, Mich.

Insulseal—Protective coatings. Eagle-Picher Co., Cincinnati, O.

Insulstic—Adhesives. Eagle-Picher Co., Cincinnati, O.

Insultape—Pipe and tubing insulation. Presstite-Keystone Engineering Products Co., A Div. of American-Marietta Co., St. Louis, Mo.

Integral—Preheaters. Crotty Mfg. Corp., Flushing, Long Island, N. Y.

Integral Jet—Burners. Stout & Sons, David, St. Louis, Mo.

Intensarc—Electrodes. National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.

Inter-Matic—Time switches. International Register Co., Chicago, Ill.

Intru-Lok—Fittings. Parker Appliance Co., The, Cleveland, O.

Involute—Spray nozzles. Yarnall-Waring Co., Philadelphia, Pa.

Ionaire—Ionization apparatus. Wesix Electric Heater Co., San Francisco, Calif.

Ionizers—Ionization apparatus. Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

Irenew—Valves. Powell Co., Wm., The, Cincinnati, O.

Irontite—Water treatment. Salsbury Corp., Los Angeles, Calif.

Ironweld—Compounds. Sight Feed Generator Co., West Alexandria, O.

Irv-o-lite—Plastic tubing. Irvington Varnish and Insulator, Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.

Isomodes—Bases and pads, vibration isolating. M. B. Mfg. Co., The, New Haven, Conn.

Isotrons—Refrigerants. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

Ivco—Roof ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

J & C—Burners, fans, furnaces, heaters. Jackson & Church Co., Saginaw, Mich.

JC 60—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.

J E—Valves, solenoids. Jackes-Evans Mfg. Co., St. Louis, Mo.

J & H Customized—Motors. Jack & Heintz, Inc., Cleveland, O.

J & L—Tubing. Jones & Laughlin Steel Corp., Pittsburgh, Pa.

J-M—Bases and pads, cement, tape. Johns-Manville, New York, N. Y.

J M Ball—Traps. Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.

J-W—Combustible gas alarms, leak detectors, leak testers. Johnson-Williams Inc., Palo Alto, Calif.

Jal Duct—Pipe. Jones & Laughlin Steel Corp., Pittsburgh, Pa.

Jal Zinc—Sheets. Jones & Laughlin Steel Corp., Pittsburgh, Pa.

Janitrol—Boilers, burners, heaters, furnaces, air conditioning units. Surface Combustion Corp., Toledo, O.

Jarene 8—Tubing. Jarrow Products, Chicago, Ill.

Jennings—Ejectors. Nash Engineering Co., South Norwalk, Conn.

Jet-Air—Air conditioning units. Wright Mfg. Co., Phoenix, Ariz.

Jetal—Protective coatings. Alrose Chemical Co., Providence, R. I.

Jet Axial—Ventilators. Detroit Blower Corp., Franklin Park, Ill.

Jetglas—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.

Jetglas—Heaters. Day & Night Mfg. Co., Monrovia, Calif.

Jet-Hard—Electrodes. The Lincoln Electric Co., Cleveland, O.

Jet Tube—Systems. McQuay, Inc., Minneapolis, Minn.

Jetweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.

Jiffy—Regulators. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.

Jiffy Clips—Hangers and supports. Mineral-lac Electric Co., Chicago, Ill.

Jiffy Dampers—Dampers. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.

John Crane—Boiler tube expanders, gaskets, seals, packing. Crane Packing Co., Morton Grove, Ill.

Join "O" Seal—Joints, pipe. Heating Equipment Co., Detroit, Mich.

Jointite—Cement and compounds. Arco Co., The, Cleveland, O.

Joint Seal—Cement. Armite Laboratories, Los Angeles, Calif.

Jorgensen—Pipe clamps. Adjustable Clamp Co., Chicago, Ill.

Jubilee—Non-metal hose. New York Belting & Packing Co., Passaic, N. J.

Junior—Radiation. Weil-McLain Co., Michigan City, Ind.

Junior—Ventilators. Octagon Ventilator Co., Chicago, Ill.

JusRite—Ducts and duct fittings, pipe and fittings. Corbman Bros., Inc., Philadelphia, Pa.

K—Fittings and flanges. Kuhns Brothers Co., Dayton, O.

KAB Kool—Air conditioning units. Metal Products Engr., Inc., Los Angeles, Calif.

K. A. T.—Compounds and water treatment. American K.A.T. Corp., Garwood, N. J.

K-Fin—Cooling and heating surface, tubing. Griscom-Russell Co., Massillon, O.

K-Louver—Sun reflecting louvers. Kawneer Co., Niles, Mich.

K and M—Controls, feeders, floats, governors, exhaust hoods, indicator-controller, regulators, separators, valve operators, strainers, traps, valves. Kieley & Mueller, Inc., Middletown, N. Y.

K-Master—Filters, eleminators, separators, traps. Kaye & MacDonald, Inc., West Orange, N. J.

K-Shield—Boiler and pipe insulation. Robinson Industries, Coleman, Mich.

Kable Kord—Belting. New York Belting & Packing Co., Passaic, N. J.

Kamlok—Couplings, fittings. Jordan Corp., Div. of OPW Corp., Cincinnati, O.

Kane—Boilers. Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.

Kaocast—Refractories and refractory cement. Babcock & Wilcox Co., Boiler Div., New York, N. Y.

Kaocrete—Refractories and refractory cement. Babcock & Wilcox Co., Boiler Div., New York, N. Y.

Kaolight—Refractories and refractory cement. Babcock & Wilcox Co., Boiler Div., New York, N. Y.

Kaowool—Refractories and refractory cement. Babcock & Wilcox Co., Boiler Div., New York, N. Y.

Kapco—Cement and compounds, pipe protectors, sheets and board. Keystone Asphalt Products Co., Chicago, Ill.

Karbate—Carbon pipe, heaters, heat exchangers, pumps. National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.

Karbonite—Destroyers. Anderson Chemical Co., Inc., Macon, Ga.

Kast-O-Lite—Refractories & refractory cement. Green Fire Brick Co., A.P., Mexico, Mo.

Kast-Set—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.

Kathabar—Dehumidifiers, unit air conditioners, humidifiers, air washers. Surface Combustion Corp., Toledo, O.

Kaylo—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.

KaytherM—Insulation. Keasbey & Mattison Co., Ambler, Pa.

Kearsarge—Packing, gaskets. Johns-Manville, New York, N. Y.

Kek—Compounds, steam and water treatments. Kenite Laboratory, Inc., Madison, N. J.

Kelbur—Bases and pads. Hobsite Products Co., Harrison, N. J.

Kel-F—Protective coatings. Lithcote Corp., Melrose Park, Ill.

Kel-Ray—X-Ray film and machines. Metal & Thermit Corp., Rahway, N. J.

Kemaloid—Water treatment compounds, boiler cleaning compounds. McMillan Industrial Supplies, C. C., Portland, Ore.

Kem Cati-Coat—Enamels and lacquers. Sherwin-Williams Co., The, Cleveland, O.

Kem Lustral—Enamels and lacquers. Sherwin-Williams Co., The, Cleveland, O.

Ken—Combustion chambers, fittings & bushings. Barclay, Inc., Robert, Chicago, Ill.

Kenbric—Soot destroyers. Kenite Laboratory, Inc., Madison, N. J.

Kennison—Nozzles. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Keps—Nuts and washers. Shakeproof Div., Illinois Tool Wks., Elgin, Ill.

Keystone—Packaged steam boiler units. Erie City Iron Wks., Erie, Pa.

Keystone—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Kidskin—Packing. Darcoid Co., Inc., New York, N. Y.

Kindorf—Bolts, hangers and supports, inserts, racks. Steel City Electric Co., Pittsburgh, Pa.

Kinetic—Gas burners. Webster Engineering Co., Tulsa, Okla.

King—Gages. Oil Equipment Mfg. Corp., New Haven, Conn.

King-clip—Valves. Lunkenheimer Co., Cincinnati, O.

King Fill—Alarms. Oil Equipment Mfg. Corp., New Haven, Conn.

King-Kool—Fans, propeller. Belco Industries, Inc., St. Louis, Mo.

Kleen Air—Filters. Kaye & MacDonald, Inc., West Orange, N. J.

Kleenflo—Unit air filters. Air-Maze Corp., Cleveland, O.

Kleen Koil—Boiler cleaning compounds. Clayton Mfg. Co., El Monte, Calif.

Kleervo—Protectors. Wright-Austin Co., Detroit, Mich.

Klero—Packing. Greene, Tweed & Co., North Wales, Pa.

Kling Felt—Gaskets, tape. Products Research Co., Los Angeles, Calif.

Klingtite—Belting. Goodyear Tire & Rubber Co., Akron, O.

Klip-Kupl—Pipe fittings. American Flow Control Corp., Houston, Tex.

Klixon—Regulators, relays, thermostats. Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.

Klondike—Arc welders, pipe thawers. Fern, Ralph, Scranton, Pa.

Knock-Out—Arc welders, torches. Lee Co., K. O., Aberdeen, S. D.

Kno-Draft—Air diffusers, sound and volume control units. Conner Engineering Corp., Danbury, Conn.

Kold Board—Insulation. Baldwin-Hill Co., Trenton, N. J.

Kold Wave—Condensers. Heat-Exchangers, Inc., Chicago, Ill.

Koncentrik—Fittings. Special Screw Products, Bedford, O.

Kontrol Motor—Diaphragm valves. Kieley & Mueller, Inc., North Bergen, N. J.

Kooler-Aire—Condensers. United States Air Conditioning Corp., Philadelphia, Pa.

Kool-Shade—Solar heat resisting screens. Reflectal Corp. Subsid., Borg-Warner Corp., Chicago, Ill.

Kool-Temp—Air conditioning units. Midwest Air Conditioning Co., Des Moines, Ia.

Kopr-Kote—Cement and compounds. Jet-Lube, Inc., Burbank, Calif.

Korda—Gaskets. Chicago Gasket Co., Chicago, Ill.

Korduct—Conduit. Johns-Manville, New York.

Kor-It—Drills. Hamlin Co., Inc., J. F., San Francisco, Calif.

Korner-King—Tools. R C S Tool Corp., Bloomington, Ill.

Korolac—Protective coatings. Goodrich Co., B. F., Akron, O.

Koroseal—Tank linings; cement and compounds; pipe couplings; ducts and duct fittings; pipe fittings; gaskets; valves. Goodrich Industrial Products Co., B. F., Akron, O.

Koroseal—Plastic pipe fittings, tubing, valves, and protective coatings. Goodrich Co., B. F., Akron, O.

Koroseal—Conduit, pipe couplings, fittings, plastic pipe, plastic sheets, plastic valves. Goodrich Industrial Products Co., B. F., Plastics Products, Marietta, O.

Korth—Boilers. Eckhart Mfg. Co., Inc., Union, N. J.

Krene—Sheets. Bakelite Co., Div. of Union Carbide & Carbon Chemicals Co., New York, N. Y.

Krome Kote—Coatings. Wolfe-Kote Co., Inc., Sheboygan, Wis.

Kromik—Coatings. Sherwin-Williams Co., The, Cleveland, O.

Kromover—Compounds. All-State Welding Alloys Co., Inc., White Plains, N. Y.

Kruzite—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.

Kuchler-Huhn—Shaft seals. Koppers Co., Inc., Metals Products Div., Baltimore, Md.

Kwick-Kupling—Couplings, joints. American Flow Control Corp., Houston, Tex.

Kwikflux—Solder. Special Chemicals Corp., Ossining, N. Y.

Kwik-Kleen—Compounds, scale removal, treatment. North American Mogul Products Co., The, Cleveland, O.

Kwik-way—Regulators. Hart & Cooley Mfg. Co., Holland, Mich.

Kwik-Steam—Boilers. Littleford Bros., Inc., Cincinnati, O.

L. A.—Motors. The Louis Allis Co., Milwaukee, Wis.

L & H—Heaters. Thermador Electrical Mfg., Los Angeles, Calif.

L & N—Indicators. Leeds & Northrup Co., Philadelphia, Pa.

La-Co—Solder and fluxes. Lake Chemical Co., Chicago, Ill.

Lagfas—Adhesives. Foster Co., Benjamin, Philadelphia, Pa.

Lagtone—Adhesives, for pipe covering. Foster Co., Benjamin, Philadelphia, Pa.

Lamneck—Ducts and duct fittings, hangers and supports, pipe and fittings, gas vent and flue. Clayton & Lambert Mfg. Co., Louisville, Ky.

LaMont—High temperature water boilers. International Boiler Works Co., The, East Stroudsburg, Pa.

Lasco—Insulation. Lynch Asbestos Co., Los Angeles, Calif.

Lawson—Wrenches. Fairmount Tool & Forging, Inc., Cleveland, O.

L-Blow—Fans, ventilators. Trade-Wind Motor Fans, Inc., Rivera, Calif.

Leader—Stocks and dies. Oster Mfg. Co., Cleveland, O.

Leader—Water heaters. Day & Night Mfg. Co., Monrovia, Calif.

Leadtex—Sheets. Revere Copper & Brass, Inc., New York, N. Y.

Leak Lock—Cement and compounds. Stewart Industries, Inc., Clifton, N. J.

Leak-Tec—Leak testers, and detectors. American Gas & Chemicals, Inc., New York.

Lectro-Clad—Protective coatings, fittings, pipe, sheets. Bart Mfg. Inc., Belleville, N. J.

Lectrodryer—Dehumidifiers. Pittsburgh Lectrodryer Co., Pittsburgh, Pa.

Led-Plate—Cement and compounds. Armite Laboratories, Los Angeles, Calif.

Ledaloyl—Sleeve bearings. Johnson Bronze Co., New Castle, Pa.

Leigh—Roof ventilators. Air Control Products, Inc., Coopersville, Mich.

Lekro-Tektor—Electrolytic devices. Marlo Coil Co., St. Louis, Mo.

Len-Lox—Ducts and Duct Fittings. Lennox Industries, Inc., Marshalltown, Ia.

Letheray—Sterilizing air units. Hanovia Chemical & Mfg. Co., Newark, N. J.

Levalarm—Alarm. Reliance Gauge Column Co., Cleveland, O.

Levelizer—Gas regulators. Mueller Climatrol, Milwaukee, Wis.

Level-Master—Regulators. Sporlan Valve Co., St. Louis, Mo.

Levelometer—Gages, recorders. Liquidometer Corp., Long Island City, N. Y.

Levelrator—Indicators, alarms, recorders, regulators, switches. Fischer & Porter Co., Hatboro, Pa.

Level-Trol—Regulators. Fisher Governor Co., Marshalltown, Ia.

Liberty—Hose. Continental Rubber Wks., Erie, Pa.

Liberty—Packing. Johns-Manville, New York.

Liberty—Ventilators, caps. Penn Ventilator Co., Philadelphia, Pa.

Life Line "A"—Electric motors. Westinghouse Electric Corp., Pittsburgh, Pa.

Lift Gate—Gates, lift, for trucks. Anthony Co., Streator, Ill.

Lightweight Champ—Pipe cutting and threading machines, pipe vise stands. Oster Mfg. Co., Cleveland, O.

Lightweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.

Lima—Stokers. Carnes, Inc., John R., Lima, O.

Limit-Load—Centrifugal fans. Buffalo Forge Co., Buffalo, N. Y.

LimiTorque—Valves, valve operators. Philadelphia Gear Works, Inc., Philadelphia, Pa.

Limitrol—Alarms. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

Lincweld—Electric motors. Lincoln Electric Co., The, Cleveland, O.

Lincwelder—Welders. Lincoln Electric Co., The, Cleveland, O.

Line-Air—Diffusers. Universal Diffuser Corp., Tuckahoe, N. Y.

Lineflow—Fans. American Blower Corp., Detroit, Mich.

Line-o-flo—Air diffusers. Barber-Colman Co., Rockford, Ill.

Link-Grip—Pipe wrenches. American Machine Wks., Inc., Racine, Wis.

Linovector—Heating surface, radiation. Vulcan Radiator Co., Hartford, Conn.

Linoventilator—Unit ventilators. Vulcan Radiator Co., Hartford, Conn.

Lipco—Cement lined fittings and pipe. Cement Lined Pipe Co., Lynn, Mass.

Liquid Eye—Sight glasses. Allin Mfg. Co., Chicago, Ill.

Liquid Ice—Water chillers and refrigerating compressors. Cool-Ette, Inc., Detroit, Mich.

Liquid Precipitator—Washers. Johnson-March Corp., Philadelphia, Pa.

Liquid Wrench—Solvent. Radiator Specialty Co., Charlotte, N. C.

Liquiflux—Welding compounds. Sight Feed Generator Co., West Alexandria, O.

Liqui-Jector—Filters. Selas Corp. of America, Dresher, Pa.

Lite Cast—Combustion chambers. Monogram Products Co., Inc., Philadelphia, Pa.

Lite-Mite—Stands, wrenches. International Forge Co., Chicago, Ill.

Lithoform—Protective coatings. American Chemical Paint Co., Ambler, Pa.

Little Beaver—Pumps. Johnston Pump Co., Pasadena, Calif.

Little Blacksmith—Punches, shears. Kidder Mfg. Co., Inc., J. F., Burlington, Vt.

Little Giant—Sump pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.

Little Giant—Stock and dies. Greenfield Tap & Die Corp., Greenfield, Mass.

Little Giant—Unit heaters. John J. Nesbitt, Inc., Philadelphia, Pa.

Little Giant—Pipe crimper tools. Pioneer Tool Company, Racine, Wis.

Livermont—Wrenches, tools. Richmont, Inc., Monrovia, Calif.

Lloyd—Solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.

Lo-Blast—Burners. Mid-Continent Metal Products Co., Chicago, Ill.

Lock-a-bar—Conduits. Stillwater Clay Products Co., The, Cleveland, O.

Lockaire—Insulation. Plastergon Wall Board Co., Buffalo, N. Y.

Lock-Joint—Ducts. Inland Steel Products Co., Milwaukee, Wis.

Lock-O-Seal—Seals. Wolfe Co., Inc., The Franklin C., Culver City, Calif.

Lockseam—Pipe. Naylor Pipe Co., Chicago.

Lodestar—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.

Lo-K—Insulation. Lockport Mills, Inc., Lockport, N. Y.

Lolag—Heaters. American Instrument Co., Inc., Silver Spring, Md.

Lo-Line—Cooling towers. Pritchard & Co. of California, J. F., Kansas City, Mo.

Long Life—Hose, packing. Goodall Rubber Co., Trenton, N. J.

Longlife—Coating. Flexrock Co., Philadelphia, Pa.

Longrip—Pipe extractors. Ridge Tool Co., Elyria, O.

Longhorn—Heaters. Hotstream Heater Co., Cleveland, O.

Lo-Set—Stokers. Canton Stoker Corp., Canton, O.

LoStoker—Stokers. Detroit Stoker Co., Detroit, Mich.

Louvent—Ventilators. Octagon Ventilator Co., Chicago, Ill.

Lo-Veyor—Conveyor. Ajax Flexible Coupling Co., Westfield, N. Y.
Lowcost—Boilers. Murray Iron Works Co., Burlington, Ia.
Lown—Machine. San Angelo Foundry & Machine Co., San Angelo, Tex.
Low Pressure Drop—Strainers. Zurn Mfg. Div., J. A., Zurn Industries, Inc., Erie, Pa.
Loxin—Bolts. Star Expansion N. Y., Inc., New York, N. Y.
Loxit—Fittings. Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Loxite—Pipe covering adhesives. Xylos Rubber Co., Akron, O.
Lucite—Plastics, powder and resins. duPont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.
Luminite—Boiler cleaning compounds, soot destroyers, steam system treatment. Warren Refining & Chemical Co., The, Cleveland, O.
Luncor—Valves. Lunkenheimer Co., Cincinnati, O.
Lusterlite—Insulation. Insulite Div. Minnesota & Ontario Paper Co., Minneapolis, Minn.
Luxaire—Heaters. Olsen Mfg. Co., C. A., Elyria, O.

M.B.—Heaters. Montgomery Bros., San Francisco, Calif.
M.D.—Boilers. Murray Iron Wks. Co., Burlington, Ia.
M. E.—Motors. Marathon Electric Mfg. Corp., Wausau, Wis.
M & F—Rubber base enamel. Valdura Div., American-Marietta Co., Chicago, Ill.
M & H—Sheets. Matthiessen & Hegeler Zinc Co., La Salle, Ill.
MIF—Couplings, fittings. Malleable Iron Fittings Co., Branford, Conn.
MKAYO—Pumps, boilers. Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
M & M—Alarms, cut-offs, feeders, operators, regulators, switches, valves. McDonnell & Miller, Inc., Chicago.
M-Pel-Air—Blades, fans. Brookside Corp., McCordsville, Ind.
M-R-C—Ball bearings. Marlin-Rockwell Corp., Jamestown, N. Y.
M-Scope—Pipe locators, leak detectors. Fisher Research Laboratory, Inc., Palo Alto, Calif.
M & T—Welders. Metal & Thermit Corp., Rahway, N. J.
M-VB—Valves. Scovill Mfg. Co., Waterville Div., Waterville, Conn.
MW-One—Adhesives, cement. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
MW-50—Adhesives, cement. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
Macheta—Fans, fan blades, ventilators. Aerovent Fan Co., Inc., Piqua, O.
Maco—Treated cloth. Menardi & Co., El Segundo, Calif.
Magic—Cement and compounds. Blue Ridge Talc Co., Inc., Henry, Va.
Magic-Aire—Fans, condensers, cooling surface, air conditioning units. United Electric Co., Wichita Falls, Tex.
Magic Carpet—Door controls. Stanley Works, The, New Britain, Conn.
Magic Dial—Pre-assembled control systems. Midwest Automatic Control Co., Des Moines, Ia.
Magic Eye—Sight glasses. Imperial Brass Mfg. Co., Chicago, Ill.
Magic Eye—Door controls. Stanley Works, The, New Britain, Conn.
Magic-Grip—Pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Magic Pivot—Electric saws. Oster Mfg. Co., John, Milwaukee, Wis.
Magic Wire—Control systems wire. Midwest Automatic Control Co., Des Moines, Ia.
Magnaflow—Pumps. The Corley Co., New York, N. Y.
Magnefer—Refractories and refractory cement. Basic Inc., Cleveland, O.
Magnehelic—Portable analyzers, gages, kits, manometers, meters, switches, testers, tubes. Dwyer Mfg. Co., F. W., Michigan City, Ind.
Magnetrol—Alarms, boiler cut-offs, switches. Schaub Engineering Co., Fred H., Chicago.
Magnex—Scale removal. Magnus Chemical Co., Garwood, N. J.
Magnorite—Cement, refractories and refractory cement. Norton Co., Worcester, Mass.
Mainliner—Fan blades and fans. Burden Co., Alan E., Los Angeles, Calif.
Make & Break—Valves. Dole Refrigerating Co., Chicago, Ill.
Make-Up-Air—Unit heaters. New York Blower Co., Chicago, Ill.
Malgate—Valves. Powell Co., Wm., The Cincinnati, O.
Malrenew—Valves. Powell Co., Wm., The, Cincinnati, O.
Manco—Plastic pipe. Manufacturers Corp., Mansfield, O.
Manganend—Electrodes. Arcos Corp., Philadelphia, Pa.
Manganweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Mang-Trode—Electrodes. Ampco Metal, Inc., Milwaukee, Wis.
Manhattan—Packing. Greene, Tweed & Co., North Wales, Pa.
Mar-Flex—Joints. Marquette Coppersmithing Co., Philadelphia, Pa.
Marine Panel—Sheets and boards. Carey Mfg. Co., Philip, Cincinnati, O.
Mark Time—Time switches. Rhodes, Inc., M. H., Hartford, Conn.
Mars—Pumps. Solar Aircraft Co., San Diego, Calif.
Marvair—Air conditioning units. Muncie Gear Works, Inc., Muncie, Ind.
Marvel—Heaters. Bastian-Morley Co., Inc., La Porte, Ind.
Marvelwite—Enamels and lacquers. Sonneborn Sons, Inc., L., New York, N. Y.
Masco—Combustion chambers. Munn & Steele, Inc., South Boston, Mass.
Mascote—Insulation, combustion chambers. Munn & Steele, Inc., South Boston, Mass.
Massachusetts—Fans, unit heaters, blower wheels, air washers, housings, ventilators. Bishop & Babcock Mfg. Co., Cleveland, O.
Master—Fittings. Mel Products Co., The, New Haven, Conn.
Master—Stokers. Muncie Gear Wks., Inc., Muncie, Ind.
Master 150#—Unions. Jefferson Union Co., Inc., New York, N. Y.
Master—Water heaters. Kehm Corp., The, Chicago, Ill.
Master-Bilt—Pumps. Schaub Engineering Co., Fred H., Chicago, Ill.
Master Pilot—Valves. Powell Co., Wm., The, Cincinnati, O.
Mastic—Concrete insulation. Poe Co., C. W., The, Cleveland, O.
Maxaw—Electric saws. Oster Mfg. Co., John, Milwaukee, Wis.
Maxdril—Drills. Oster Mfg. Co., John, Milwaukee, Wis.
Maximon—Gages. J. E. Longergan Co., Philadelphia, Pa.
Maxsteam—Boilers. Martin Co., Inc., J. O., San Francisco, Calif.
McGregor—Glasses. Chesterton Co., A. W., Everett, Mass.
Measure Marked—Plastic pipe. Plastex Corp., Columbus, O.
Measurrench—Wrenches. Williams & Co., J. H., Buffalo, N. Y.
Mechanipak—Seals. Garlock Packing Co., Palmyra, N. Y.
Meco—Torches, compounds, flame cutters, leak detectors, gages, regulators, valves, welding rod. Modern Engineering Co., St. Louis, Mo.
Medrae—Conductors and panels, heaters. Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Melco—Piping oxygen, air conditioning units. Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
Meletron—Switches. Barksdale Valves, Los Angeles, Calif.
Mercury—Pipe cutting machines, pipe cutters. Obear & Son, W. F., Inglewood, Calif.
Merrill Process—Heating systems. Parks-Cramer Co., Fitchburg, Mass.
Metagraphic—Transmitters. Bristol Co., The, Waterbury, Conn.
Metakote—Enamels and lacquers. Tropical Paint Co., Cleveland, O.
Metalbestos—Caps, pipe and fittings. Wallace Co., William, Metalbestos Div., Belmont, Calif.
Metal-Master—Shears. Wiss & Sons Co., J., Newark, N. J.
Metalflo—Tubes and tubing. H & H Tube & Mfg. Co., Detroit, Mich.
Metalhide—Protective coatings. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Metameter—Transmitters. Bristol Co., The, Waterbury, Conn.
Meteor—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Met-L-Flex—Bases and pads. Robinson Aviation, Inc. Teterboro, N. J.
Met-L-Tex—Protective coatings. France Refractories Co., J. H., Snow Shoe, Pa.
Metl-Tech—Doors and panels, metal sheets. Technical Ply-Wood Sales, Chicago, Ill.
Mex-Ko—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Miami—Fans. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
Mica—Conduit. Flexaust Co., New York, N. Y.
Micafil—Insulation. Munn and Steele, Inc., South Boston, Mass.
Micro—Low water cut-offs. Maid-O'-Mist, Inc., Chicago, Ill.
Micro-Feed—Humidifiers. Cleveland Humidifier Co., Cleveland, O.
Micro-Feeder—Pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Micro-filters—Filters. Selas Corp. of America, Dresher, Pa.
Microflex—Bases and pads. L.O.F. Glass Fibers Co., Toledo, O.
Micro-Klean—Filters, strainers. Cuno Engineering Corp., Meriden, Conn.
Microlite—Insulation, wrap pipe. L.O.F. Glass Fibers Co., Toledo, O.
Micromet—Water treatment. Calgon Inc., Pittsburgh, Pa.
Micro Motors—Motors. Redmond Co., Inc., Owosso, Mich.
Micro-Netic—Feeders. Campbell Co., J. A., Long Beach, Calif.
MicroRold—Sheets. Washington Steel Corp., Washington, Pa.
Microtex—Insulation, pipe wrap. L.O.F. Glass Fibers Co., Toledo, O.
Microtherm—Thermostats. Barber-Colman Co., Rockford, Ill.
Micro-Weld—Spot welders. Micro Products Co., Chicago, Ill.
Midco—Heaters. Mid-Continent Metal Products Co., Chicago, Ill.
Midget—Radiation. Utica Radiator Corp., Utica, N. Y.
Midget—Float valves. Maid-O'-Mist, Inc., Chicago, Ill.
Midget Powerhouse—Unit heaters. Century Engineering Corp., Cedar Rapids, Ia.
Midwest—Pumps. Tech-Tron Corp., Lawrence, Kans.
Mighty Midget—Drills. Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Mighty Mite—Thermostats. Mechanical Industries Production Co., Akron, O.
Milcor—Angles, ducts, doors and panels, hangers and supports. Inland Steel Products Co., Milwaukee, Wis.
Milford—Tools. Thompson & Son Co., The, Henry G., New Haven, Conn.
Mills—Boilers. Smith Co., Inc., H. B., The Westfield, Mass.
Milvaco—Strainers, valves. Milwaukee Valve Co., Milwaukee, Wis.
Mindicator—Gages. Dickson Co., The, Chicago, Ill.
Mineralead—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.
Minicordes—Recorders. Dickson Co., The, Chicago, Ill.
Mipco—Valves. Associated Valve & Engineering Co., Chicago, Ill.
Miracle—Adhesives, fasteners. Devices, Inc., A Div. of Miracle Adhesives Corp., New York, N. Y.
Miracle Red—Coatings. Debevoise Co., The, Brooklyn, N. Y.
Mixend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.
Mizzou—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Mobilbead—Dehumidifiers. Socony-Mobil Oil Co., Inc., New York, N. Y.
Mobilene—Gaskets. Johns-Manville, New York, N. Y.
Model-F—Wrenches. Richmont, Inc., Monrovia, Calif.
Model Star—Valves. Powell Co., Wm., The, Cincinnati, O.
Moderator—Heating Systems. Webster & Co., Warren, Camden, N. J.
ModernAire—Fans, unit air conditioners. National Gas Equipment Co., Inc., Denison, Tex.
Modu-Aire—Air conditioning units. United States Air Conditioning Corp., Philadelphia, Pa.
Moduflow—Control systems. Minneapolis-Honeywell Regulator Co., Minneapolis.
Modulatic—Boilers. Vapor Heating Corp., Chicago, Ill.
Modutrol—Heating systems, valve and duct operators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modutron—Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modu-Wave—Welders. Sciaky Bros., Inc., Chicago, Ill.
Mogul—Packing. Johns-Manville, New York.
Moisture Magnet—Dehumidifiers. Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Moldisc—Grinders and grinding wheels. Raybestos-Manhattan, Inc., Passaic, N. J.
Moncref—Ducts and duct fittings, heaters, tin pipe, air conditioning units. Henry Furnace Co., The, Medina, O.
Monel—Pipe fittings, flanges, pipe, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.
Monend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.
Monmouth—Humidifiers, Valves. Cleveland Humidifier Co., Cleveland, O.
Monobolt—Chillers, heat exchangers, oil coolers, water heaters. Graham Mfg. Co., New York, N. Y.
Mono-Cast—Pipe. American Cast Iron Pipe Co., Birmingham, Ala.
Monocast—Refractories and refractory cement. Ramtite Co., The, Chicago, Ill.
Monoflo—Hot water heating systems and fittings. Bell & Gossett Co., Morton Grove, Ill.
Monofold—Manifolds and headers. Dahl, G. W., Bristol, R. I.
Monogram—Combustion chambers. Grant Wilson, Inc., Chicago, Ill.
Mono-Line—Refractories. Quigley Co., Inc., New York, N. Y.

Mono Motors—Motors. Redmond Co., Inc., Owosso, Mich.
Mono-Peen—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.
Monotube—Drives. Link-Belt Co., Chicago, Ill.
Monovent—Ventilators. Burt Mfg. Co., Akron.
Monoweld—Electrodes, arc welding. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Monoxer—Carbon dioxide analyzers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Monoxivent—Fittings. Kent-Moore Organization, Inc., Warren, Mich.
Monsoon—Fans. Jamieson Mfg. Co., Dallas, Texas.
Morflex—Flexible couplings. Morse Chain Co., Ithaca, N. Y.
Morgrip—V belts. Maurey Mfg. Corp., Chicago, Ill.
Morlex—Steam system treatment. Carbide & Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York.
Mortite—Gaskets, tape. Mortell Co., J. W., Kankakee, Ill.
Moto-Merco—Relays. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
MotoReducer—Speed reducers. Philadelphia Gear Works, Inc., Philadelphia, Pa.
Motorstoker—Stokers. Hershey Motorstoker, Inc., Manheim, Pa.
Motosteel—Valves. Taylor Instrument Companies, Rochester, N. Y.
Mototrol—Indicator-controllers. Automatic Control Co., St. Paul, Minn.
Mototurb—Ventilators. Uno Ventilator Co., Malden, Mass.
Mouat—Compounds, eliminators, traps. Squires Co., C. E., The, Cleveland, O.
Mounts—Base and pads. Lord Mfg. Co., Erie, Pa.
Muckle-Vent—Ventilators. Muckle Mfg. Co., Owatonna, Minn.
Multalarm—Alarms. Automatic Control Co., St. Paul, Minn.
Multiblade—Welding fume exhausters. General Blower Co., Morton Grove, Ill.
Multiclone—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.
Multi-Cold—Compressors. Multiplex Mfg. Co., Berwick, Pa.
Multi-Duty—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Multi-Duty—Pulleys and sheaves. Gates Rubber Co., The, Denver, Colo.
Multi-Flex—Ducts and duct fittings. United States Rubber Co., New York, N. Y.
Multi-Louver—Drives. Link Belt Co., Chicago, Ill.
Multi Mount—Speed reducers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Multiplane—Vibration isolating bases. Lord Mfg. Co., Erie, Pa.
Multiple Retort Stoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Multi-Pul—Hoists. Multiple Corp., Dayton, O.
Multi-Seal—Repair plugs. Kenney Co., L. C., Chicago, Ill.
Multitherm—Air conditioning units. Clarage Fan Co., Kalamazoo, Mich.
Multi-Tip—Gas burners. Dalzen Mfg. Co., St. Clair, Mich.
Multi-V—V-belts. Goodrich Co., B. F., Akron.
Multivane—Fans, blowers. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Multi-V-Drive—Drives. Worthington Corp., Harrison, N. J.
Multi-Wash—Dust collectors, washers. Schneible Co., Claude B., Detroit, Mich.
Murex—Welding electrodes. Metal & Thermit Corp., Rahway, N. J.

N-B—Boilers. Nebraska Boiler Co., Inc., Lincoln, Nebr.
NCG—Leak detectors, solder, oxygen systems, torches, welding rod. National Cylinder Gas Co., Chicago, Ill.
N-M-D—Valves. Lunkenheimer Co., Cincinnati, O.
NYB—Heating surface, fans, unit heaters. New York Blower Co., Chicago, Ill.
Nail-A-Matic—Tools. Matrix Engineering Corp., Minneapolis, Minn.
Nalco—Solder. National Lead Co., New York.
Nalco—Water treatment, soot destroyers. National Aluminate Corp., Chicago, Ill.
National Ground Anodes—Devices. National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National—Cutters. Wachs Co., E. H., The, Chicago, Ill.
National—Fans, furnaces, heaters. MaGirl Foundry & Furnace Co., Bloomington, Ill.
Natur Temp—Insulation. Plastergon Wall Board Co., Buffalo, N. Y.
Naturzone—Insulation. Wilson & Co., Inc., Chicago, Ill.
Navalon—Fiber packing. Johns-Manville, New York, N. Y.
N.E. Hite—Units. Barclay, Inc., Robert, Chicago, Ill.
Nelson—Stokers, air diffusers, pumps, air conditioning units, ventilators. Heating Assurance, Inc., Spokane, Wash.
Nelweld—Welders. Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.
Nemo—Insulating cement. Smith & Kanzler Corp., Linden, N. J.
Neobon—Corrosion shields for pipe joints. Atlas Mineral Products Co., Mertztown, Pa.
Neo Coat—Coatings. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Neoprene—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.
Nerva-Kote—Protective coatings. Rubber and Plastics Compound Co., New York, N. Y.
Nerva-Plast—Protective coatings. Rubber and Plastics Compound Co., New York, N. Y.
Nervatape—Industrial tape. Rubber & Plastics Compound Co., New York, N. Y.
Nev-A-Rust—Protective coatings. The Glidden Co., Cleveland, O.
New Cyclone—Dust collectors. Kirk & Blum Mfg. Co., Cincinnati, O.
New Multifin—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
New Port—Pumps. Everite Pump & Mfg. Corp., Lancaster, Pa.
Niagara—Meters. Buffalo Meter Co., Buffalo.
Nibco—Fittings, flanges, joints, valves. Northern Indiana Brass Co., Elkhart, Ind.
Nib-Shear—Power shears. H. A. Mfg. Co., York, Pa.
Nickelend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nickel-Arc—Electrodes. Alloy Rods Co., York, Pa.
Nickend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nicloy—Pipe, tubes, tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Nicuend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nifer—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
"9000" Arc—Torches. Mid-States Welder Mfg. Co., Chicago, Ill.
No Crush—Hose. Ammerman Co., Inc., Minneapolis, Minn.
No Drip—Insulation, insulating cement, protective coatings. J. W. Mortell Co., Kankakee, Ill.
No Drip Tape—Pipe insulation, pipe wrap. Mortell Co., J. W., Kankakee, Ill.
Nocordal—Pipe coils, refrigerating condensers, and heat exchangers. Heil Process Equipment Corp., Cleveland, O.
No-Flex—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
No-Mar—Pipe wrenches. Nielsen, Inc., E. V., Stamford, Conn.
Non-Clog—Sewage ejectors and pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Non-clog—Pipe line strainers. Boylston Steam Specialty Co., Chicago, Ill.
Non-Clogging—Spray nozzles. Link-Belt Co., Chicago, Ill.
Non-Con-Dux—Cement, insulation. Grant Wilson, Inc., Chicago, Ill.
Non-Frost—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Nonisol—Sludge prevention treatment. Alrose Chemical Co., Providence, R. I.
Non-Sweat—Insulation. Keasbey & Mattison Co., Ambler, Pa.
No-Ox-Id—Protective coatings. Dearborn Chemical Co., Chicago, Ill.
No-Ox-Id Warp—Protective coatings. Dearborn Chemical Co., Chicago, Ill.
Norblo—Dust collectors, fans. Northern Blower Co., Cleveland, O.
Norcoat—Tank linings. Norwood Associated Engineers, Inc., Springfield, Mass.
Nordensson—Burners. Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Northco—Ventilators. Wood Mfg. Co., A. R., Luverne, Minn.
No-Spat—Welding compounds. Midland Paint & Varnish Co., Cleveland, O.
No-Thread—Fittings. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Novelon—Protective coatings, tank linings. Novelty Steam Boiler Wks., Inc., Baltimore, Md.
No-Vent—Pumps and systems. Stout & Sons, David, St. Louis, Mo.
Novoid—Insulation, adhesives, vibration isolating bases. National Cork Co., Englewood, N. J.
Nu-Air—Adsorbers. Manning Co., Charles E. Pittsburgh, Pa.
Nu-Air—Fans, window ventilator units, blades, louvers and shutters, radiation. Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Nu-Alpina—Ventilators. Inland Steel Products Co.. Milwaukee, Wis.
Nullmatic—Gages, indicators, insulation, recorders. Moore Products Co., The, Philadelphia, Pa.
Nu-Notch—Mushroom ventilators. Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
NuTwist—Welders. Mallory Co., P. R., The, Indianapolis, Ind.
Nu-Vac—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N.J.
Nu-Wrap—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Nyavco—Valves, gages. New York Air Valve Corp., Brooklyn, N. Y.
Nylaflow—Non-metal hose and fittings. Polymer Corp., The, Reading, Pa.
Nylasint—Plastics, powder and resins. Polymer Corp. of Pa., Reading, Pa.
Nylatron—Plastics, powder and resins. Polymer Corp. of Pa., Reading, Pa.
Nylo-Seal—Plastic tubing. Imperial Brass Mfg. Co., Chicago, Ill.

OB—Valves. Ohio Brass Co., Mansfield, O.
OCH—Filters. American Air Filter Co., Louisville, Ky.
OPW—Strainers. Jordan Corp., Div. of OPW Corp., Cincinnati, O.
O&S—Burners. Orr & Sembower, Inc., Reading, Pa.
Octopus—Welding fume exhausters. Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Ohioan—Heaters. Hotstream Heater Co., Cleveland, O.
Ohmstone—Panel and control boards. Johns-Manville, New York, N.Y.
Oil—Valves. Ohio Injector Co., Wadsworth, O.
Oil-A-Fire—Burners. Automatic Corp., St. Louis, Mo.
Oilbuster—Boiler cleaning compounds. Cannon Chemical Co., Inc., Cambridge, Mass.
Oil-O-Matic—Oil burners, heaters. Williams Div., Eureka Williams Corp., Bloomington, Ill.
Oiltex—Gaskets. Chicago Gasket Co., Chicago, Ill.
Okay Tred—Leather belting. Houghton & Co., E. F., Philadelphia, Pa.
Ol' Faithful—Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.
Omega—Joints. Marquette Coppersmithing Co., Philadelphia, Pa.
Omniguard—Temperature alarms. Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
One-Hander—Wrenches. National Pipe Coatings, Inc., Huntington Park, Calif.
Oriflo—Flanges. Builders-Providence, Inc., B-I-F Industries, Inc., Providence, R. I.
Ori-Flowrator—Flow measuring orifices. Fischer & Porter Co., Hatboro, Pa.
"O" Rings—Packing. Linear Inc., Philadelphia, Pa.
Oversize—Refrigerant dehydrators. Wabash Corp., Chicago, Ill.
Oxequip—Oxygen systems, pumps, valves. Oxygen Equipment & Service Co., Chicago.
Ox-Gem—Treatment. Anderson Chemical Co., Inc., Macon, Ga.
Oxweld—Welding rod, oxygen piping & regulating systems, regulators, welding and cutting apparatus. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Oxyarc—Welding and cutting apparatus. Arcos Corp., Philadelphia, Pa.
Oyltite-Stik—Cements and compounds. Lake Chemical Co., Chicago, Ill.
Ozark—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Ozite—Insulation. American Hair & Felt Co., Chicago, Ill.
Ozonators—Ozone apparatus. Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

PA 400—Dehydrant and acid neutralizer. Davison Chemical Co., Div. of W. R. Grace & Co., Baltimore, Md.
P. B. H.—Cocks, protectors, try cocks. Paul B. Huyette Co., Inc., Philadelphia, Pa.
P-D—Fittings. Sullivan Valve & Engineering Co., Butte, Mont.
P-D—Pumps. Peters-Dalton, Inc., Detroit.
PD—Blowers, dust collectors, stacks and chimneys, fans. Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
PD QC—Pipe machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
P.E.T.—Drills and motors. Portable Electric Tools, Inc., Chicago, Ill.
P & H—Welding electrodes, engines; hoists, arc welders. Harnischfeger Corp., Milwaukee, Wis.
P.I.V. Variable Speed Drive—Changer. Link-Belt Co., Chicago, Ill.
P-K—Eliminators. Patterson-Kelley Co., Inc., The, E. Stroudsburg, Pa.
PSC—Regulators, dehumidifiers. Perfecting Service Co., Charlotte, N. C.
Pace-King—Boilers. Burnham Corp., Irvington, N. Y.
Pacemaker—Softeners. Stover Water Softener Co., St. Charles, Ill.
Pacemakers—Coolers. McQuay, Inc., Minneapolis, Minn.
Pacific—Furnaces. Rosebraugh Co., W. W., Salem, Ore.

Pacific Coast—Refrigerant dehydrators. Wabash Corp., Chicago, Ill.

Packex—Sewage ejectors. Yeomans Bros. Co., Melrose Park, Ill.

Paco—Turbine pumps. Pacific Pumping Co., Oakland, Calif.

Page Sensor—Alarms. Hogart Engineering Co., Los Angeles, Calif.

Paget—Strainers. Self Cleaning Strainer Co., Oak Lawn, Ill.

PAINTGRIP—Sheets. Armco Steel Corp., Middletown, O.

Paladin—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.

Palco—Packing. Greene, Tweed & Co., North Wales, Pa.

Palcotan—Water treatment. Pacific Lumber Co., The, San Francisco, Calif.

Palco Wool-Saferized—Insulation. Pacific Lumber Co., The, San Francisco, Calif.

Palmaire—Air conditioning units, furnaces, blower wheels, window ventilator units, unit heaters, humidifiers. Palmer Mfg. Corp., Phoenix, Ariz.

Palmetto—Packing, gaskets, shaft seals. Greene, Tweed & Co., North Wales, Pa.

Palmetto SuperSheat—Gaskets. Greene, Tweed & Co., North Wales, Pa.

Pandux—Thermometer wells. Pacific Transducer Corp., Los Angeles, Calif.

Panelair—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.

Panelbloc—Heaters. Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.

Panel Coil—Coils, exchangers, heaters. Dean Thermo-Panel Coil Div., Dean Products, Inc., Brooklyn, N.Y.

Panelray—Heaters. Day & Night Mfg. Co., Monrovia, Calif.

Panel-Tex—Panel and control boards. Norristown Asbestos Div., Nicolet Industries, Inc., Norristown, Pa.

Paneltrol—Valves. Taco Heaters, Inc., Cranston, R. I.

Panther—Plastic pipes. Western Plastics Corp., Tacoma, Wash.

Papco—Cutters and tools. Penn Brass & Copper Co., Erie, Pa.

Par—Air compressors. Lynch Corp., Anderson, Ind.

Paracoil—Coils, condensers, heaters, leak detectors, oil coolers, exchangers, preheaters, steam traps, water chillers, aftercoolers, heating units, valves, vaporizers. Davis Engineering Corp., Elizabeth, N. J.

Paraline—Motor bases. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Parallel Shaft—Reducers and increasers. Link-Belt Co., Chicago, Ill.

Paramount Master—Air conditioning units. Essick Mfg. Co., Los Angeles, Calif.

Parasol—Spray nozzles. Spraying Systems Co., Bellwood, Ill.

Pathfinder—Belting. Goodyear Tire & Rubber Co., Akron, O.

Peak-Temp—Preheaters, fuel oil. Cleaver-Brooks Co., Milwaukee, Wis.

Peck Carrier—Conveyors. Link-Belt Co., Chicago, Ill.

Pee Vee Cee—Fittings, hoods, plastic pipe. Atlas Mineral Products Co., Mertztown, Pa.

Pee Vee Seal—Cement and compounds. Atlas Mineral Products Co., Mertztown, Pa.

Peerless—Pipe machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.

Peerless—Direct radiation, hangers or brackets. American Radiator & Standard Sanitary Corp., Pittsburgh.

Pelro—Asbestos packing. Greene, Tweed & Co., North Wales, Pa.

Penflex—Hose, flexible. Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.

Penflex-Weld—Adsorbers. Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.

Pennco—Sectional cast iron boilers. Pennsylvania Furnace & Iron Co., Warren, Pa.

Penn Domex—Ventilators. Penn Ventilator Co., Philadelphia, Pa.

Penn-M-Co—Fittings. Penn Mfg. Corp. of Washington, Pa., Washington, Pa.

Penn-Power—Ventilators. Penn Ventilator Co., Philadelphia, Pa.

Penn Pullman—Ventilators. Penn Ventilator Co., Philadelphia, Pa.

Pennsalt Perchloron—Treatment. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

Pennsalt PM-90—Compounds, treatment. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

Penn-Turbine—Ventilators. Penn Ventilator Co., Philadelphia, Pa.

Perfectaire—Dampers, dehumidifiers, fans, furnaces, heaters, humidifiers, louvers and shutters, air conditioning units. Air Conditioning Engineering Co., Cambridge, Mass.

Perfection—Plates. Beaton & Cadwell Mfg. Co., New Britain, Conn.

Perfecto—Observation boiler ports, cement. Green Fire Brick Co., A. P., Mexico, Mo.

Perfecto—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.

Perflex—Hose. Perfecting Service Co., Charlotte, N. C.

Perfusaire—Diffusers, registers. Auer Register Co., Cleveland, O.

Perimaheat—Radiation. Young Radiator Co., Racine, Wis.

Perma-Code—Identification markers, pipe, hole and saddle markers. Brady Co., W. H., Milwaukee, Wis.

Permadine—Protective coatings. American Chemical Paint Co., Ambler, Pa.

Perma-Fan—Condensers. Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.

Permaglas—Stacks & chimneys. Smith Corp., A. O., Milwaukee, Wis.

Permagum—Adhesives. Presstite-Keystone Engineering Products Co., A Div. of American-Marietta Co., St. Louis, Mo.

Perm-Align—Drills. Oster Mfg. Co., John, Milwaukee, Wis.

Permanite—Plastic pipe, ducts and duct fittings, and valves. Knight, Maurice A., Akron, O.

Permaseal—Gaskets. Chicago Gasket Co., Chicago, Ill.

Pero-Nite—Soot destroyers. Perolin Co., Inc., New York, N. Y.

Pexto—Brakes, punches, shears, wrenches, machines. Peck, Stow & Wilcox Co., Southington, Conn.

Phenolex Liquid Aluminum—High temperature paint. Claronex Products, Inc., Brooklyn, N. Y.

Philatrol—Changers, feeders. Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.

Phil-O-Feeder—Feeders. Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.

Phos-Trode—Electrodes. Ampco Metal, Inc., Milwaukee, Wis.

Photoswitch—Switches. Combustion Control Div., Electronics Corp. of America, Cambridge, Mass.

Pic—Malleable unions. Dart Union Co., Providence, R. I.

Pic—Steel unions. Fairbanks Co., The, New York, N. Y.

Pilostat—Flame failure controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Pilot—Valves. Powell Co., Wm., The, Cincinnati, O.

Pilot Generator—Valves. General Controls Co., Glendale, Calif.

Pioneer—Thermostats. Crown Controls Co., Inc., New Bremen, O.

Pipe Line—Strainers. Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.

Pipeasy—Pipe Cement. Flexrock Co., Philadelphia, Pa.

Pipemaster—Wrenches, pipe vise stands, pipe cutters and vises. Erie Tool Wks., Erie, Pa.

Pipetite-Stik—Cements and compounds. Lake Chemical Co., Chicago, Ill.

Pistonair—Motors. Joy Mfg. Co., Pittsburgh, Pa.

Pitchlign—Roller bearings. Roller Bearing Co. of America, West Trenton, N. J.

Pittsburgh—Unit heaters. Automatic Gas Equipment Co., Pittsburgh, Pa.

Pittsburgh-National—Meters. Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.

Plain—Radiation. Vapor Heating Corp., Chicago, Ill.

Planeweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.

Plasgon—Cement and compounds. Samuel Cabot, Inc., Boston, Mass.

Plaskon—Plastics, powders and resins. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.

Plastaloy—Ducts and duct fittings, plastic sheets, tanks. Atlas Mineral Products Co., Mertztown, Pa.

Plastic Gasket—Pipe cement. Flexrock Co., Philadelphia, Pa.

Plasticord—Wiring. Chester Cable Corp., Chester, N. Y.

Plasticote—Electric wire. Chester Cable Corp., Chester, N. Y.

Plastilock—Adhesives. Goodrich Industrial Products Co., B. F., Akron, O.

Plastimode—Sheets. Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, Los Angeles, Calif.

Plastograph—Viscometers. Brabender Corp., Rochelle Park, N. J.

Plastoid—Furnace cement. Plastic Products Co., Detroit, Mich.

Pla-Tank—Ducts and duct fittings, plastic sheets, plastic tubing. Haveg Industries, Inc., Newark, Del.

Platecoils—Coils and radiation, exchangers, heaters, finned surface, superheaters. Tranter Mfg., Inc., Lansing, Mich.

Playford—Stokers. Rosedale Foundry & Machine Co., Pittsburgh, Pa.

Plenum Humidifier—Humidifiers. Hermidifier Co., Neffsville, Pa.

Plexiform—Fans. Bayley Blower Co., Milwaukee, Wis.

Plicast—Refractories. Plibrico Co., Chicago, Ill.

Plidco-Flanges—Fittings, flanges. Pipe Line Development Co., Cleveland, O.

Pliogard—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.

Pliotron—Filters. Goodyear Tire & Rubber Co., Akron, O.

Plisulate—Insulating cement and insulation. Plibrico Co., Chicago.

Plumber Krak-Stik—Cement and compounds. Lake Chemical Co., Chicago, Ill.

Plumrite—Pipe. Bridgeport Brass Co., Bridgeport, Conn.

Pluralloy—Electrodes. McKay Co., Pittsburgh, Pa.

Pluto-Blue Asbestos—Packing. North American Asbestos Corp., Chicago, Ill.

Ply-Tech—Plywood sheets and board. Technical Ply-Wood Sales, Chicago, Ill.

Pneumastat—Aftercoolers. Schramm, Inc., West Chester, Pa.

Pneumatractor—Aftercoolers. Schramm, Inc., West Chester, Pa.

Pneum-A-trol—Feeders. Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.

Pneu-Pump—Pumps. Yeomans Bros. Co., Melrose Park, Ill.

Poeco—Insulation, coatings, concrete insulating. Poe Co., C. W., Cleveland, O.

Polar Pak—Air conditioning units. Coleman Co., Inc., The, Wichita, Kans.

Polartron—Relays, regulators, systems, switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Poly-Flo—Plastic tubing. Imperial Brass Mfg. Co., Chicago, Ill.

Polymerin—Protective coatings, enamel and lacquers. International Corp., Finishes Div., Newark, N. J.

Polypenco—Plastic pipe, tubing. Polymer Corp., The, Reading, Pa.

Polyprene—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.

Polytherm—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.

Pony—Pipe clamps. Adjustable Clamp Co., Chicago, Ill.

Popular—Wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.

Poro-Klean—Filters. Cuno Engineering Corp., Meriden, Conn.

Poronze—Filters and porous metals. Wabash Corp., Chicago.

Poro-Stone—Filters, dehumidifiers. Adams Co., Inc., R. P., Buffalo, N. Y.

Porta-Heet—Heaters. Auburn Burner Co., Auburn, Ind.

Port-A-Pony—Pipe cutting machines. Thread-Ezy Mfg. Co., Corunna, Mich.

Porta Drive—Pipe cutting machines. Muncie Gear Wks., Inc., Muncie, Ind.

Porto-Power—Pipe benders and pipe pushers, pumps, punches. Blackhawk Mfg. Co., Milwaukee, Wis.

Porto Shears—Shears. Black & Decker Mfg. Co., Towson, Md.

Portovent—Hose, ducts and duct fittings. Flexaust Co., New York, N. Y.

Posit-Aire—Roof ventilators. Tripar Products, Inc., Royal Oak, Mich.

Positive Arc—Arc welders. Welding Apparatus Co., Chicago, Ill.

Power—Belting. Rhoads & Sons, J. E., Wilmington, Del.

Powairsaver—Propeller fans. Pritchard & Co. of California, J. F., Kansas City, Mo.

Poweraire—Furnaces. Jackson & Church Co., Saginaw, Mich.

Powerated—Furnaces. Jackson & Church Co., Saginaw, Mich.

Power-Flame—Leak detectors. Justrite Mfg. Co., Chicago, Ill.

Power-Flame—Burners, gas. Siemon Mfg. Co., Grandview, Mo.

Power-Flo—Fans, blowers, housings, ventilators. Brookside Corp., McCordsville, Ind.

Power-Flow—Ventilators. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.

Power Gems—Boilers. Edge Moor Iron Works, Inc., Edge Moor, Del.

Powermaster—Boilers. Orr & Sembower, Inc., Reading, Pa.

Poweroil—Oil burners. Jackson & Church Co., Saginaw, Mich.

Power-Pak—Boilers. Orr & Sembower, Inc., Reading Pa.

Power-Poise Line—Electric motors. Brown-Brockmeyer Co., Inc., Dayton, O.

Power Vane CP—Drills, motors. Chicago Pneumatic Tool Co., New York, N. Y.

Power vent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.

Prasco & 85% magnesia—Insulation, insulating cement. Fibreboard Paper Products Corp., San Francisco, Calif.

Pratt & Cady—Valves. R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.

Pre-Bilt—Conveyors. Link-Belt Co., Chicago, Ill.

Precision—Nozzles. Benjamin Air Rifle Co., St. Louis, Mo.

Pre-Krete—Coatings, tank linings. Patterson-Kelley Co., Inc., The, E. Stroudsburg, Pa.

Premier—Welding rod. American Steel & Wire Div., United States Steel, Cleveland, O.

Pre-Notch—Ducts and duct fittings. Gray Metal Products, Inc., Rochester, N. Y.
Pressure-Speed—Parts for heating and air conditioning equipment. Refrigeration Devices Co., Nutley, N. J.
Pressuretrol—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis.
Prestal—Pipe and tube benders. Tal Bending Equipment, Inc., Milwaukee, Wis.
Prest-O-Lite—Leak detectors, torches. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Presto-Lock—Couplings. Smith Bros. Co., Oak Park, Ill.
Prest-O-Weld—Welding and cutting apparatus, regulators. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York.
PreSwitch—Switches. Longergan Co., J. E., Philadelphia, Pa.
Princo—Gages, alarms, hygrometers, manometers, psychrometers, regulators, relays, thermometers. Precision Thermometer and Instrument Co., Philadelphia, Pa.
Progress—Boilers. Cleaver-Brooks Co., Milwaukee, Wis.
Propeloflo—Meters. Builders - Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Protecto—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.
Protectoglo—Controls. Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Protectomotor—Air filter separators. Dollinger Corp., Rochester, N. Y.
Protectorelay—Flame failure controls, relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Protekoflex—Insulation. Miracle Adhesives Corp., Bellmore, N. Y.
Protektinseal—Tape, protective coatings. Miracle Adhesives Corp., Bellmore, N. Y.
Pryzoak—Belting. Graton & Knight Co., Inc., Worcester, Mass.
Psychron—Psychrometers. Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Pul Air—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Pul-Air Ridge—Ventilators. Penn, Ventilator Co., Philadelphia, Pa.
Pulling—Circulators, pumps. Columbus Steam Pump Works Co., Columbus, O.
Pulsatherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Pulverzone—Stokers. American Coal Burner and Wood Stoker Corp., Chicago, Ill.
PurAir—Adsorbers, air filters, ventilators. Barneby-Cheney Co., Columbus, O.
Purecel—Filters. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Pur-O-Fiers—Filters, separators. ACRC Div. of Hills-McCanna Co., Chicago, Ill.
Purox—Welding and cutting apparatus, regulators. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Pylets—Switches, pilot and signal lights. Pyle-National Co., The, Chicago, Ill.
Pyramid—Packing. Greene, Tweed & Co., North Wales, Pa.
Pyratherm—Controls. Mercoid Corp., The, Chicago, Ill.
Pyrex—Glass pipe, conductors and panels, wells, heat exchangers, gage and sight glasses, valves, coils. Corning Glass Wks., Corning, N. Y.
Pyroflex—Coatings, tank linings, lined pipes, tanks, enamels and lacquers. Knight, Maurice A., Akron.
Pyrotac—Alarms. Illinois Testing Laboratories, Inc., Chicago, Ill.
Pyrotrol—Flame failure controls. Bristol Co., The, Waterbury, Conn.
Pyrotron—Recorders. Bailey Meter Co., Cleveland, O.
Pyrovisor—Controls. Bristol Co., The, Waterbury, Conn.

QD—Pulleys and sheaves. Worthington Corp., Harrison, N. J.
QSU—Couplings. Dahl, G. W., Bristol, R. I.
QS—Circulators, drains, eliminators, fittings, regulators, valves. Quality Specialty Co., Inc., Camden, N. J.
Q-T—Sheets and Boards, non-metallic. Celotex Corp., The, Chicago, Ill.
Q-T Ductliner—Insulation. Celotex Corp., The, Chicago, Ill.
Q-Chromastic—Refractories. Quigley Co., Inc., New York, N. Y.
Q-Chrome—Refractories. Quigley Co., Inc., New York, N. Y.
Q-Seal—Cement. Quigley Co., Inc., New York, N. Y.
Q-Seal-Damit—Boiler sealing compounds. Quigley Co., Inc., New York, N. Y.
Quantrol—Vanes. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Quartzoid—Sprinkler heads. Grinnell Co., Inc., Providence, R. I.
Quick-as-Wink—Valves. C. B. Hunt & Son, Inc., Salem, O.
Quick-Coupler—Valves. Dole Refrigerating Co., Chicago, Ill.
Quiet-Flex—Absorbers, hose, joints. Vibration Mountings, Inc., Corona, N. Y.
Quik Heter—Conductors and panels. Adam Electric Co., Frank, St. Louis, Mo.
Quik-Mask—Gaskets. Brady Co., W. H., Milwaukee, Wis.
Quik-Temp—Steam traps. Schaub Engineering Co., Fred H., Chicago, Ill.

RBC—Roller bearings. Roller Bearing Co. of America, West Trenton, N. J.
RB Integral Fan Bases—Bases and pads. Vibration Mountings, Inc., Corona, N. Y.
RB Pressure—Pressure blowers. Western Blower Co., Seattle, Wash.
RB Vibration Rails—Bases and pads. Vibration Mountings, Inc., Corona, N. Y.
RC Geared—Couplings. Link-Belt Co., Chicago, Ill.
R & G—Grilles, registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
RH—Air conditioning units. McQuay, Inc., Minneapolis, Minn.
RH Hanger—Absorbers, hangers. Vibration Mountings, Inc., Corona, N. Y.
R. I.—Unions. Rhode Island Fittings Co., Providence, R. I.
R-K—Regulators, valves. Ruggles-Klingemann Mfg. Co., Boston, Mass.
R-M—Packing. Raybestos-Manhattan, Inc., Passaic, N. J.
R & M All-Weather—Motors. Robbins & Myers, Inc., Springfield, O.
R & M Moyno—Pumps. Robbins & Meyers, Inc., Springfield, O.
R-Mir-Dek—Protective coatings. Miracle Adhesives Corp., New York, N. Y.
RP—Air filters. Research Products Corp., Madison, Wis.
R/S Controls—Valves. Refrigerating Specialties Co., Chicago, Ill.
R-U-F—Fans. Reed Unit-Fans, Inc., New Orleans, La.
Racon Boilers—Heaters. Radiant Heat & Cooling Corp., Santa Clara, Calif.
Racon Kit—Coils and panels. Radiant Heat & Cooling Corp., Santa Clara, Calif.
Radiafin—Finned tubing, finned surface. Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Radial—Unit coolers. McQuay, Inc., Minneapolis, Minn.
Radiant—Direct radiation. Burnham Corp., Irvington, N. Y.
Radiant Baseboard—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Radiantrim—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Radiantrol—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.
RadiaVector—Radiation. Dunkirk Radiator Corp., Dunkirk, N. Y.
Radi-Heator—Heaters. Summit Products Co., Uniontown, Pa.
Radi-Ion—Ionization apparatus. Montgomery Bros., San Francisco, Calif.
Radi - Vector—Radiation. Vulcan Radiator Co., Hartford, Conn.
Radolite—Cement, refractories. Pyrolite Products Co., Cleveland, O.
Rador—Thermostats. Vapor Heating Corp., Chicago, Ill.
Rajah—Packing. Johns-Manville, New York, N. Y.
Ramiclase—Refractories and refractory cement. Basic Inc., Cleveland, O.
Ramset—Refractories and refractory cement. Basic Inc., Cleveland, O.
Ramex—Drills, regulators, tools. Nielsen, Inc., E. V., Stamford, Conn.
Ranarex—Analyzers, indicators, recorders. Permutit Co., New York, N. Y.
Rapid—Oil coolers. Bell & Gossett Co., Morton Grove, Ill.
Rapiduction—Pipe cutting machines. Oster Mfg. Co., Cleveland, O.
Rapiduction Jr.—Pipe cutting and threading machines. Oster Mfg. Co., Cleveland, O.
Ratogate—Valves. Fischer & Porter Co., Hatboro, Pa.
Ratosight—Alarms, flow switches. Fischer & Porter Co., Hatboro, Pa.
Raydiant—Radiation. Weil-McLain Co., Michigan City, Ind.
Rayduct—Pipe. Bethlehem Steel Co., Bethlehem, Pa.
Reading—Fittings, valves. R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Ready-Pack—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Reco—Steam convertors, heat exchangers, headers, heaters, preheaters, tanks, fuel economizers, separators. . Richmond Engineering Co., Richmond, Va.
Reco—Controllers and starters, motors, coils, drains, water filters. Reynolds Electric Co., River Grove, Ill.
Reco-Radi-Aire—Fans. Reynolds Electric Co., River Grove, Ill.
Recold—Refrigerating evaporative condensers, coolers, cooling & heating surface, cooling towers, air conditioning units. Refrigeration Engineering, Inc., Los Angeles, Calif.
Record-O-Stat—Recorder-controllers. Johnson Service Co., Milwaukee, Wis.
Rectilinear—Burners. Webster Engineering Co., Tulsa, Okla.
Red Cap—Ventilators. Warner Ventilator Co., La Grange, Ind.
Red Devil—Furnace and pipe joint cement. Pecora Paint Co., Philadelphia, Pa.
Red Diamond—Refrigerants. Liquid Carbonic Corp., Chicago, Ill.
Red Head—Tongs. Billings & Spencer Co., Hartford, Conn.
Red Head—Valves. Imperial Brass Mfg. Co., Chicago, Ill.
Redi-Bends—Coils. Capitol Mfg. & Supply Co., Columbus, O.
Redi-Return—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
Redi-Vac—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
Red-Reading-Mercury—Hygrometers, psychrometers, thermometers. Palmer Thermometers, Inc., Cincinnati, O.
Red Seal—Gaskets. Chicago Gasket Co., Chicago, Ill.
Red Socket—Wrenches. Lowell Wrench Co., Worcester, Mass.
Red Top—Thermostats. H-B Instrument Co., Philadelphia, Pa.
Red Top—Insulation. United States Gypsum Co., Chicago, Ill.
Red Top—Hangers and supports. Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Reductors—Reducers. Boston Gear Works, Quincy, Mass.
Redycote—Coatings. Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga..
Refrigerated Kooler-Aire—Air conditioning units. United States Air Conditioning Corp., Philadelphia, Pa.
Rego—Regulators, welding and cutting apparatus. National Cylinder Gas Co., Chicago, Ill.
ReGalv—Coatings. Rotometals, San Francisco, Calif.
Relatrol—Heating systems. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Reliance—Belting, packing. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Reliance—Filters and regulators. American Meter Co., Inc., Philadelphia, Pa.
Remotaire—Air conditioning units. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Remote—Indicators. Yarnall - Waring Co., Philadelphia, Pa.
Renewo—Valves, boiler gage cocks. Lunkenheimer Co., Cincinnati, O.
Renu-Glas—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Renu-Vent—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Rep—Boiler Compounds. Kenite Laboratory, Madison, N. J.
Reps—Extractors. Walton Co., Hartford, Conn.
Research—Belting. Graton & Knight Co., Inc., Worcester, Mass.
Resiscote—Enamels and lacquers. Reilly Tar & Chemical Corp., Indianapolis, Ind.
Resorb—Adsorbers, dehumidifiers. Barnebey-Cheney Co., Columbus, O.
Revolving—Heaters. Wing Mfg. Co., L. J., New York, N. Y.
Revolving—Ventilators. Burt Mfg. Co., Akron, O.
Rex—Chain drives, coal and ash conveyors, couplings, nozzles, bearings, pumps. Chain Belt Co., Milwaukee, Wis.
Rex—Heaters. Cleveland Heaters Co., Cleveland, O.
Rex—Fans, ventilators, wheels. Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Rexarc—Electrodes, positioners and welders. Sight Feed Generator Co., West Alexandria, O.
Rex-Flex—Hose, and tubing. Flexonics Corp., Maywood, Ill.
Rexglas—Water heaters. The Cleveland Heater Co., Cleveland, O.
Rexrust—Protective coatings. Continental Products Co., Euclid, O.
Rex-Tube—Duct connections, duct fittings, hose, and tubing. Flexonics Corp., Maywood, Ill.
Rex-Weld—Hose and tubing. Flexonics Corp., Maywood, Ill.
Rexweld—Electrodes. Crucible Steel Co. of America, Pittsburgh, Pa.
Rezistal—Sheets. Crucible Steel Co. of America, Pittsburgh, Pa.
Rhinamel—Enamels and lacquers. Tropical Paint Co., Cleveland, O.
Rid-All—Adsorbers, odor. Abbeon Supply Co., Jamaica, N. Y.
Ridgevent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Ridgid—Pipe cutting machines, drives, extractors, stocks & dies, stands, wrenches, cutters, chasers, reamers, vises. Ridge Tool Co., Elyria, O.

Ridgoil—Oil. Ridge Tool Co., Elyria, O.
Rifco—Unions. Rhode Island Fittings Co., Providence, R. I.
Riflex—Vibration absorbers. United Metal Hose Co., Inc., Long Island City, N. Y.
Rigidon—Pipe. Heil Process Equipment Corp., Cleveland, O.
Rigid-Tex-Metals—Sheets. Rigidized Metals Corp., Buffalo, N. Y.
Rigivin—Plastic pipe. Heil Process Equipment Corp., Cleveland, O.
Rihco—Humidifiers. R. I. Humidifier & Ventilating Co., Inc., Cambridge, Mass.
Rincontrol—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.
Rimcor—Controls, indicator-controllers, smoke alarms, regulators, systems. Reliance Instrument Mfg. Corp., Glen Cove, Long Island, N. Y.
Ring-Tite—Couplings. Johns-Manville, New York, N. Y.
Rip-pl—Enamels and lacquers. Hilo Varnish Corp., Div. of Carpenter-Morton Co., Everett, Mass.
Ripple-Fin—Cooling and heating surface. McQuay, Inc., Minneapolis, Minn.
Risselt—Air eliminators. Moreheat Distribution, Inc., Cincinnati, O.
Robot—Switches. Miller-Harris Instrument Co., Milwaukee, Wis.
Robot-Eye—Regulators, smoke alarms. Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
Rock—Pipe protectors. Keystone Asphalt Products Co., Chicago, Ill.
Rock cork—Pipe insulation. Johns-Manville, New York, N. Y.
Rocksil—Insulation. North American Asbestos Corp., Chicago, Ill.
Rocop—Heaters. Rome-Turney Radiator Co., Rome, N. Y.
Rod Pak—Electrodes. Marquette Mfg. Co., Inc., Minneapolis, Minn.
Rodpak—Packing. Sims Pump Valve Co., Hoboken, N. J.
Rodpax—Packing. National Engineering Products, Inc., Washington, D. C.
Ro-Fin—Tubing. Rome-Turney Radiator Co., Rome, N. Y.
Ro-Flo—Compressors, pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Rolagrip—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Rol-Air—Tools. Imperial Brass Mfg. Co., Chicago, Ill.
Roll-a-Bend—Pipe benders. Radiant Devices, St. Louis, Mo.
Roll-Bond—Heat exchangers. Olin Mathieson Chemical Corp., Metals Div., New York, N. Y.
Roll-O-Matic—Filters. American Air Filter Co., Inc., Louisville, Ky.
Rollotron—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Rollway—Pumps. Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Roomaire—Air conditioning units. Young Radiator Co., Racine, Wis.
Roomaster—Units. Ajax Corp. of America, Evansville, Ind.
Rotameter—Flow meters. Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Rotary Amvent—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.
Rotary Union—Pipe joints. Perfecting Service Co., Charlotte, N. C.
Rotary Valvent—Ventilators. Swartwout Co., The, Cleveland, O.
Roto-Clone—Dust collectors. American Air Filter Co., Inc., Louisville, Ky.
Roto-Cup—Gas and oil burners. Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Rotodip—Chemical feeders. Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I.
Rotograte Stoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Rotojet—Spray nozzles. Binks Mfg. Co., Chicago, Ill.
Roto-louvre—Dryers. Link-Belt Co., Chicago.
Rotomet—Solder and fluxes. Rotometals, San Francisco, Calif.
Rotometric—Solder and fluxes. Rotometals, San Francisco, Calif.
Roto-Mold—Packing. Linear Inc., Philadelphia, Pa.
Rotonetic—Gas burners. Webster Engineering Co., Tulsa, Okla.
RotoStoker—Stokers. Detroit Stoker Co., Detroit, Mich.
RotoStoker—Type C-C—Stokers. Detroit Stoker Co., Detroit, Mich.
Roto-Torq—Tools. Richmont, Inc., Monrovia, Calif.
Roto-trol—Liquid pressure regulators, indicators, and switches. Healy Ruff Co., St. Paul, Minn.
Roto-Wash—Booths. Griffin & Co., Louisville, Ky.
Rotrtwist—Drills. Star Expansion N. Y., Inc., New York, N. Y.
Roxaprene—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Royal—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Royal—Packing. United States Rubber Co., New York, N. Y.
Royal-Aire—Air conditioning units. Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
Royal Clipper—Cutters and shears. M-M-A, Inc., Lancaster, Pa.
Royal, The—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Rubalt—Enamels and lacquers, protective coatings, high temperature paint. Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Rub-R-Lon—Enamels and lacquers. Acorn Paint and Chemical Co., Cleveland, O.
Rubyfluid—Solder. Ruby Chemical Co., Columbus, O.
Rusco—Window panels. Russell Co., F. C., The, Cleveland, O.
Rusco Prime—Windows. Russell Co., F. C., The, Cleveland, O.
Rust Bloc No. 20—Coatings. Turco Products, Inc., Los Angeles, Calif.
Rustbuster—Cleaning compounds, water treatment. Cannon Chemical Co., Inc., Cambridge, Mass.
Rust Eradicator—Water treatment. North American Mogul Products Co., The, Cleveland, O.
Rust Evade—Coatings. Turco Products, Inc., Los Angeles, Calif.
Rust Raider—Compounds. Radiator Specialty Co., Charlotte, N. C.
Rust Remover—Compounds. Turco Products, Inc., Los Angeles, Calif.
Rust Veto—Protective Coatings. E. F. Houghton & Co., Philadelphia, Pa.

S-A—Conveyors, feeders. Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
SA—Valves. Lunkenheimer Co., Cincinnati, O.
SCR—Air conditioning units. Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U. S. Radiator Corp., Johnstown, Pa.
S.F.E.—Insulation. Standard Fuel Engineering Co., Detroit, Mich.
SH Hanger—Absorbers, hangers. Vibration Mountings, Inc., Corona, N. Y.
S I—Analyzers, indicators, recorders and systems. Standard Instrument Div., Heat-Timer Corp., New York, N. Y.
S & P—Burners, governors, preheaters, strainers, fuel oil units, valves. Staples & Pfeiffer, San Francisco, Calif.
S. R. P.—Protective coatings. Sonneborn Sons, Inc., L., New York, N. Y.
SSS—Belting. Goodall Rubber Co., Trenton, N. J.
Saco—Speed reducers. Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.
Safe-Flo—Heaters. Screw Machine Products Co., Portland, Ore.
Safe-T-Aire—Air sterilizing units, and lamps. Hanovia Chemical & Mfg. Co., Newark, N. J.
Safe-T-Submersion—Boilers, burners, heaters. Stout & Sons, David, St. Louis, Mo.
Safe Guard—Fuel oil preheaters. Alstrom Corp., New York, N. Y.
Safeway Load-Lift—Trucks. American Pulley Co., The, Philadelphia, Pa.
Saint Louis—Stokers. Ormsby-Osterman, Inc., St. Louis, Mo.
Sairset—Cement, refractories and refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Sal Brick—Solder and fluxes. American Solder & Flux Co., Philadelphia, Pa.
Sal-Mo—Cement, insulation, gaskets, packing, connections, sheets and board. Sall Mountain Div., Nicolet Industries, Inc., Hamilton, O.
Sanbanol—Fuel oil treatment. American Sand-Banum Co., Inc., Freeport, N. Y.
Sanitizer—Treatment. Oakite Products, Inc., New York, N. Y.
Santobrite—Water treatment. Monsanto Chemical Co., St. Louis, Mo.
Santocel—Insulation. Monsanto Chemical Co., Merimac Div., Boston, Mass.
Santolene—Fuel oil treatment. Monsanto Chemical Co., St. Louis, Mo.
Santosite—Water treatment. Monsanto Chemical Co., St. Louis, Mo.
Sarancote—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.
Sarine—Treatment. Berna Corp., Garwood, N. J.
Sarine-Amid—Treatment. Berna Corp., Garwood, N. J.
Satanite—Refractories & refractory cement. Green Fire Brick Co., A. P., Mexico, Mo.
Saunders—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Saunders—Pipe cutters. Erie Tool Works, Erie, Pa.
Saunders—Diaphragm valves. Grinnell Co., Inc., Providence, R. I.
Saunders Patent—Valves. Hills-McCanna Co., Chicago, Ill.
Sav-A-Tank—Fuel oil treatment. Sudbury Laboratory, South Sudbury, Mass.
Scentinel—Compounds. Ampion Corp., Long Island City, N. Y.
Schmidt—Torches. Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Schwan—Propeller pumps. Haertel Co., Walter, Minneapolis, Minn.
Schwan—Gas burners. Jamieson Mfg. Co., Dallas, Texas.
Scotch—Adhesive tape and pipe wrap. Minnesota Mining & Mfg. Co., St .Paul, Minn.
Scotch-Mund—Boilers. Mund Boilers, Inc., Los Angeles, Calif.
Scotchrap—Tape. Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Detroit, Mich.
Scout—Water heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Screw King—Reducers and increasers. American Pulley Co., The, Philadelphia, Pa.
Screw-Seal—Pipe. Robinson Clay Product Co., Inc., The, Akron, O.
Scroll-Aire—Air heaters. Newcomb-Detroit Co., Detroit, Mich.
Scruin—Bolts. Star Expansion N. Y., Inc., New York, N. Y.
Scru-peller—Sewage ejectors and pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.
Sea Lion—Leather belting. Chicago Belting Div., Chicago-Allis Mfg. Corp., Chicago, Ill.
Sea Rings—Asbestos packing. Johns-Manville, New York, N. Y.
Sealastic—Fittings, leak detectors. Chicago Forging and Mfg. Co., Chicago, Ill.
Sealdflow—Cooling tower fan drives. Pritchard & Co. of California, J. F., Kansas City, Mo.
Sealeak—Compounds. Ampion Corp., Long Island City, N. Y.
Sealed Life—V-Belts. Dodge Mfg. Corp., Mishawaka, Ind.
Sealfas—Adhesives. Foster Co., Benjamin, Philadelphia, Pa.
Sealmore—Cement and compounds. Armite Laboratories, Los Angeles, Calif.
Sealon—Tank linings. Knight, Maurice A., Akron, O.
Sealpak—Boards. Reliance Electric & Engineering Co., Cleveland, O.
Seal-Rite—Cement and compounds. Macksons Co., New York, N. Y.
Sealtite—Conduits. American Metal Hose Div., American Brass Co., Waterbury, Conn.
Seasonmaster—Air conditioning units. McQuay, Inc., Minneapolis, Minn.
Seasonmaster—Units. McQuay, Inc., Minneapolis, Minn.
Seigelite—Gaskets. Johns-Manville, New York.
Seilon—Plastic sheets. Seiberling Rubber Co., Newcomberstown, O.
Selectair—Air conditioning units. Johnson Co., S. T., Oakland, Calif.
Selectrol—Regulators. Automatic Control Co., St. Paul, Minn.
Selflube—Sleeve bearings. Keystone Carbon Co., Inc., St. Marys, Pa.
Sel-Lok—Parts for heating and air conditioning equipment. Standard Pressed Steel Co., Jenkintown, Pa.
Sells—Bearings. Royersford Foundry & Machine Co., Royersford, Pa.
Sensitrol—Relays. Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., Newark, N. J.
Sentinel—Alarms. Johnson-Williams Inc., Palo Alto, Calif.
Sentry—Valves. Coppus Engineering Corp., Worcester, Mass.
Sentry—Valves. McRae Specialty Co., Don, Glendale, Calif.
Sentry—Alarms, and smoke recorders. Edwards, L. V., Rockville Center, N. Y.
Sentry—Draft controls, draft regulators. Krueger Sentry Gauge Co., Green Bay, Wis.
Sep-return—Separators. Wabash Corp., Chicago, Ill.
Sequestrene—Water softeners. Alrose Chemical Co., Providence, R. I.
Serval—Gaskets. Chicago Gasket Co., Chicago, Ill.
Service—Packing. Johns-Manville, New York.
Servicecoat—Enamels and lacquers. Debevoise Co., The, Brooklyn, N. Y.
Sesure—Gages, Yarnall-Waring Co., Philadelphia, Pa.
Severn—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Shafconaire—Unit heaters. OverHead Heaters, Inc., Detroit, Mich.
Shafer—Bearings. Chain Belt Co., Milwaukee, Wis.
Shaft King—Reducers, drives. American Pulley Co., The, Philadelphia, Pa.
Shawco—Bends, headers. Shaw Co., Benjamin F., Wilmington, Del.
Shear-Flex—Bases and pads, noise elimination for cooling towers. Vibration Mountings, Inc., Corona, N. Y.

Shear-Seal—Valves. Barksdale Valves, Los Angeles, Calif.
Shelby—Tubing. National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Shield—Pipe protectors. Keystone Asphalt Products Co., Chicago, Ill.
Shield-Arc—Electrodes, arc welders. Lincoln Electric Co., Cleveland, O.
Shockmounts—Bases and pads. Lord Mfg. Co., Erie, Pa.
Shokstop—Absorbers. Wade Mfg. Co., Elgin, Ill.
Shoktrol—Adsorbers. Zurn Mfg. Div., J. A., Zurn Industries, Inc., Erie, Pa.
Shone—Sewage ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Shop King—Welders. Precision Welder Mfg. Co., Chicago, Ill.
Shopmate—Drills. Portable Electric Tools, Inc., Chicago, Ill.
Shuntflo—Meters. Builders-Providence, Inc., Div. of B-I-F Industries Inc., Providence, R. I.
Shure-Set—Tools. Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., Cleveland, O.
Shur-Flo—Switches. Hays Mfg. Co., Erie, Pa.
Shur-Flo—Fans. Walker Mfg. & Sales Co., St. Joseph, Mo.
Shur-Grip—Tools. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Shuttle Break—Switches. Adam Electric Co., Frank, St. Louis, Mo.
Shut-O-Vent—Louvers and shutters. Reed Unit-Fans, Inc., New Orleans, La.
Sigma—Air diffusers, perforated panels. Wakefield Co., The, Vermilion, O.
Signico—Pilot and signal lights. Signal Indicator Corp., Brooklyn, N. Y.
Silastic—Packing. Dow Corning Corp., Midland, Mich.
Silence Service—Noise elimination. Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Silent-Aire—Fans, propeller. Swift Mfg. Co. Inc., Royal Oak, Mich.
Silent-Auburn—Burners, heaters, air conditioning units. Auburn Burner Co., Auburn, Ind.
Silent-Breeze—Fans, louvers and shutters, window and ventilator units. Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Silent Chain—Drives. Link-Belt Co., Chicago, Ill.
Silent Duct—Connections. Elgen Mfg. Corp., Long Island City, N. Y.
Silent Korth—Burners. Eckhart Mfg. Co., Inc., Union, N. J.
Silentride—V belts. Zatko Metal Products Co., Euclid, O.
Silentvane—Fans. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Silent Vent—Ventilators. Detroit Blower Corp., Franklin Park, Ill.
Sil-Fos—Solder. Handy & Harman, New York, N. Y.
Silica Gel—Refrigerant dehydrators. Eagle Chemical Co., Inc., Chicago, Ill.
Silicon-Alkyd—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.
Silicone—Protective coatings. Dow Corning Corp., Midland, Mich.
Silimite—Water treatment. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Sillimanite—Refractories and refractory cement. Taylor Sons Co., Charles, Cincinnati.
Sill-Line—Radiation. Nesbitt, Inc., John J., Philadelphia, Pa.
Siloo—Solvents, fuel oil treatment. Petroleum Solvents Corp., New York, N. Y.
Siltube—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Silver Comet—Coatings. Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Silverlume—Paint. Wilbur & Williams Co., Brighton, Mass.
Silver Steel—Tools. Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind.
Silverstreak—Drives. Link-Belt Co., Chicago, Ill.
Silver Stream—Spray nozzles. Skinner Irrigation Co., Troy, O.
Silvertop—Eliminators, traps. Anderson Co., V. D., The, Div. of International Basic Economy Corp., Cleveland, O.
SilWeld—Solder. Eutectic Welding Alloys Corp., Flushing, N. Y.
Simplex—Gages. Viking Pump Co., Cedar Falls, Ia.
Simplex—Regulators. Bell & Gossett Co., Morton Grove, Ill.
Simplex—Wrenches. Lowell Wrench Co., Worcester, Mass.
Simsestos—Packing. Sims Pump Valve Co., Hoboken, N. J.
Simsite—Packing. Sims Pump Valve Co., Hoboken, N. J.
Sim-Trol—Controls, combustion regulators. Simplex Mfg. Co., Fond du Lac, Wis.
Sine Switch—Switches. Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Single-Flow—Cooling towers. Marley Co., The, Kansas City, Mo.
Sioux—Electric drills, grinders and grinding wheels, saws, shafts. Albertson & Co., Inc., Sioux City, Ia.
Siphon—Ventilators. Octagon Ventilator Co., Chicago, Ill.
Sirocco—Blowers, fans. American Blower Corp., Detroit, Mich.
Skelly—Stokers. Combustion Engineering, Inc., New York, N. Y.
Skip-Tooth—Dies. Nye Tool Co., Chicago, Ill.
Sky-Blast—Roof fan ventilators. Propellair Div., Robbins & Myers Inc., Springfield, O.
Skymaster—Ventilators. Acme Equipment Co., Muskogee, Okla.
Slenderizer—Direct radiation. Burnham Corp., Irvington, N. Y.
Slo-Speed—Reducers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Sludge Solvent No. 32—Fuel oil treatment. Montgomery Chemical Co., Jenkintown, Pa.
Sludgit—Fuel oil treatment. Anderson Chemical Co., Inc., Macon, Ga.
Sludgout—Fuel oil treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Slugin—Bolts. Star Expansion N. Y., Inc., New York, N. Y.
Smith-Clamp—Pipe repair clamps. Pipe Line Development Co., Cleveland, O.
Smith-Dolan—Electric preheaters and stress relievers. Electric Arc, Inc., Newark, N. J.
Snapin—Bolts. Star Expansion N. Y., Inc., New York, N. Y.
Snap-Rite—Ducts and duct fittings. Gray Metal Products, Inc., Rochester, N. Y.
Sno-Breeze—Air conditioning units, blower wheels. Palmer Mfg. Corp., Phoenix, Ariz.
Snip-It—Air filters. C.L.B. Co., Houston, Tex.
Snug—Radiation. Weil-McLain Co., Michigan City, Ind.
Sockolets—Fittings. Bonney Forge & Tool Wks., Allentown, Pa.
Sof Tite—Sheets. Wheeling Corrugating Co., Wheeling, W. Va.
Sof Tite—Sheets. Wheeling Steel Corp., Wheeling, W. Va.
Softweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Solar Flame—Burners. National-U.S. Radiator Corp., Johnstown, Pa.
Solar-Flux—Compounds. Solar Aircraft Co., San Diego, Calif.
Solray—Radiation. Weil-McLain Co., Michigan City, Ind.
Sol-vet—Cleaning compounds, water treatment. Anderson-Stolz Corp., Kansas City, Mo.
Solvex—Cleaning compounds. Chemical Solvent Co., Birmingham, Ala.
Solvo-Rust—Solvent. Permatex Co., Inc., Brooklyn, N. Y.
Sonderglass—Glasses. Chesterton Co., A. W., Everett, Mass.
Sonic-Ray—Heaters. Bica Co., Girard, O.
Sonoairduct—Ducts. Sonoco Products Co., Hartsville, S. C.
So-Soft—Softeners. Stover Water Softener Co., St. Charles, Ill.
Soundliner—Insulation. Baldwin-Hill Co., Trenton, N. J.
Sound Metal—Noise elimination. Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Soundscope—Testers. Marsh Instruments Co., Skokie, Ill.
Soundscope—Indicators. Mine Safety Appliances Co., Pittsburgh, Pa.
Sound Stream—Insulation. Industrial Sound Control Dept. of Koppers Co., Inc., Metal Products Div., Baltimore, Md.
Sound-Zorbers—Vibration absorbers and pipe. Finn & Co., Inc., T. R., Hawthorne, N. J.
Sovereign—Packing. Darcoid Co., Inc., New York, N. Y.
Space Saver—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.
Sparktrodes—Electrodes. Dielectric Products Co., Inc., Jersey City, N. J.
Spartan—Packing, belting. Graton & Knight Co., Inc., Worcester, Mass.
Spasaver—Cooler units, Drayer-Hanson, Div. of National-U.S. Radiator Corp., Los Angeles, Calif.
Spearhead—Gasket cutters. Zimmerman Packing Co., Cincinnati, O.
Special X—Solder. Industrial Service Laboratories, Milwaukee, Wis.
Spe-D-Flar—Tools. Engesser & Co., William L., El Monte, Calif.
Speedaire—Reducers. Cleveland Worm & Gear Co., Cleveland, O.
Speedaire—Compressors. Dayton Electric Mfg. Co., Chicago, Ill.
Speed Clamps—Hose clamps. Tinnerman Products, Inc., Cleveland, O.
Speed Clips—Insulation fasteners. Tinnerman Products, Inc., Cleveland, O.
Speed Drills—Drills. Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago, Ill.
Speed Grinders—Grinders. Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago.
Speed Grips—Nuts. Tinnerman Products, Inc., Cleveland, O.
Speedheater—Unit heaters. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Speed Nuts—Locknuts. Tinnerman Products, Inc., Cleveland, O.
Speedomax—Indicator and recorder-controllers, recorders, thermometers. Leeds & Northrup Co., Philadelphia, Pa.
Speed Primer—Pumps. Chain Belt Co., Milwaukee, Wis.
Speed-Rex—Protective coatings. Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Detroit, Mich.
Speed-Thru—Pipe pushers. Mercury Hydraulics, Inc., Denver, Colo.
Speed-Trol—Changers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Speed Variator—Changers. Cleveland Worm and Gear Co., Cleveland, O.
Speedweld—Electrodes. Trindl Products, Ltd., Chicago, Ill.
Speedy—Clamps, cutters, packing, plugs, tools, wrenches. Chicago Specialty Mfg. Co., Chicago, Ill.
Speedy-Cal—Nameplates. North Shore Nameplate Co., Bayside, N. Y.
Speedy-Marx—Identification markers. North Shore Nameplate Co., Bayside, N. Y.
Spekaluminite—Coatings. Special Chemicals Corp., Ossining, N. Y.
Spekleen—Compounds. Special Chemicals Corp., Ossining, N. Y.
Sphero—Ball type and Blow-off valves. Fairbanks Co., New York, N. Y.
Spinner—Gravity ventilators. Warner Ventilator Co., LaGrange, Ind.
Spinner—Ventilators. Inland Steel Products Co., Milwaukee, Wis.
Spin-seat—Steam trap floats. Reichert Float & Mfg. Co., Toledo, O.
Spintex—Building and duct insulation. Johns-Manville, New York, N. Y.
Spiralweld—Nickel plated pipe. Taylor Forge & Pipe Wks., Chicago, Ill.
Spiratube—Ducts and duct fittings, hose, tubing. Flexible Tubing Corp., Guilford, Conn.
Spiraweld—Pipes. Naylor Pipe Co., Chicago.
Spiro—Heaters. Stout & Sons, David, St. Louis, Mo.
Spirodome—Spray nozzles. Fluor Products Co., A Div. of the Fluor Corp., Ltd., Air Conditioning & Refrigeration Cooling Tower Div., Whittier, Calif.
Spi-Rol-Fin—Radiation. Edwards Engineering Corp., Pompton Plains, N. J.
Spirotallic—Gaskets. Johns-Manville, New York, N. Y.
Spirovane—Fans. Western Blower Co., Seattle, Wash.
Spongex—Bases and pads, gaskets, pipe insulation. Sponge Products Div., B. F. Goodrich Co., Shelton, Conn.
Spotaire—Air conditioning units. Drayer-Hanson, Div. of National-U. S. Radiator Corp., Los Angeles, Calif.
Spraco—Booths, nozzles aftercoolers, humidifiers, regulators, systems, separators, strainers, washers. Spray Engineering Co., Somerville, Mass.
Spra-Rite—Nozzles. Binks Mfg. Co., Chicago.
Spratower—Cooling Towers. Marley Co., The, Kansas City, Mo.
Spray-Acoustic—Insulation. Sprayo Flake Co., Chicago, Ill.
Spray-It—Air compressors, viscosimeters. Thomas Industries, Inc., Electric Sprayit Div., Sheboygan, Wis.
Spray-Mastic—Protective coatings. Eagle-Picher Co., Cincinnati, O.
Spraywheel—Air washers. Mountain States Equipment Co., Denver, Colo.
Spring-Flex—Absorbers, bases and pads, hangers, noise elimination for cooling tower. Vibration Mountings, Inc., Corona, N. Y.
Springin—Bolts. Star Expansion N. Y., Inc., New York, N. Y.
Spun steel—Pulleys, sheaves. Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O.
Square-Fin—Radiation. Slant-Fin Radiator Corp., Richmond Hill, N. Y.
Stabilflo—Valves. Foxboro Co., Foxboro, Mass.
Stabilizer—Controls. Boston Machine Works Co., Lynn, Mass.
Stack-Head—Dampers. Air Control Products, Inc., Coopersville, Mich.
Stainlend—Electrodes. Arcos Corp., Philadelphia, Pa.
StainRod—Rods. Eutectic Welding Alloys Corp., Flushing, N. Y.
StainTrode—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Stainweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Stalostic—Protective coatings. Eagle-Picher Co., Cincinnati, O.
Standard—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N. J.
Standard—Ventilators. Burt Mfg. Co., Akron, O.
Standardaire—High pressure blowers. Read Standard Corp., Blower-Stoker Div., York, Pa
Standforated—Grilles. Standard Stamping & Perforating Co., Chicago, Ill.
Star-O-Zone—Ozone apparatus. Norwood Associated Engineers Inc., Springfield, Mass.

Statick—Ventilators. Hirschman-Pohle Co., Inc., Le Roy, N. Y.

Stat-O-Seal—Seals. Wolfe Co., Inc., The Franklin C., Culver City, Calif.

Staxauster—Roof ventilators. Allen Cooler & Ventilator, Inc., Rochester, Mich.

Staynew—Filters, silencers. Dollinger Corp., Rochester, N. Y.

Stazin—Bolts. Star Expansion N. Y., Inc., New York, N. Y.

Steam-Pak—Boilers. York-Shipley, Inc., York, Pa.

Steam-Pakette—Boilers. York-Shipley, Inc., York, Pa.

Steelarc—Electrodes, arc welding. All-State Welding Alloys Co., Inc., White Plains, N. Y.

Steelbestos—Metal sheets. American Steel Band Co., Pittsburgh, Pa.

Steelfin—Surface. New York Blower Co., Chicago, Ill.

Steelflex—Couplings. Falk Corp., Milwaukee.

SteelTectic—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.

Steelweld—Brakes, power shears. Cleveland Crane & Eng. Co., Wickliffe, O.

Steen—Cutters, pipe cleaning machines. Continental Machine Co., Chicago, Ill.

Stemco—Thermostats. Stevens Mfg. Co., Inc., Mansfield, O.

Sterilamp—Lamps. Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.

Steritron—Water treatment, water sterilizing units. Hanovia Chemical & Mfg. Co., Newark, N. J.

Sterlco—Pumps, strainers, regulators, traps. Sterling, Inc., Milwaukee.

Sterling-Magic—Non-metal hose. New York Belting & Packing Co., Passaic, N. J.

Stictite—Cement, insulation. Refractory & Insulation Corp., New York, N. Y.

Stillson Heavy Duty Walco—Wrenches. Walworth Co., New York, N. Y.

Stirling—Boilers. Babcock & Wilcox Co., Boiler Div., New York, N. Y.

Stok-A-Fire—Stokers. Automatic Corp., St. Louis, Mo.

Stokerlay—Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Stonewall—Board and sheets. Ruberoid Co., New York, N. Y.

Storm Shade—Windows. Ingersoll Products Div., Borg-Warner Corp., Chicago, Ill.

Straitflo—Strainers. Hays Mfg. Co., Erie, Pa.

Strand—Grinders and grinding wheels. Franklin Balmar Corp., Baltimore, Md.

Streamjet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.

Streamline—Couplings, coils, filters, dehydrators, glasses, plugs, purgers, sheets, solder, parts for heating and air conditioning equipment, cutters, fittings, heat exchangers, manifolds, nipples, pipe, strainers, tubing, unions, valves. Mueller Brass Co., Port Huron, Mich.

Streamlined—Chambers. Green Fire Brick Co., A. P., Mexico, Mo.

Streamliner—Registers. Auer Register Co., Cleveland, O.

Streamliner—Belting. New York Belting & Packing Co., Passaic, N. J.

Strickler—Pipe cutting and threading machines. Wachs Co., E. H., The, Chicago, Ill.

Stronghold—Belting. Rhoads & Sons, J. E., Wilmington, Del.

Stubby—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N. J.

Studin—Bolts. Star Expansion N. Y., Inc., New York, N. Y.

Styrofoam—Insulation. Dow Chemical Co., The, Midland, Mich.

Sudden Depth—Drill. Paine Co., Addison, Ill.

Sullivan—Controls. Cole-Sewell Engineering Co., St. Paul, Minn.

Summeraire—Heaters. Clayton Mfg. Co., El Monte, Calif.

Sunair—Heaters. Mission Appliance Corp., Hawthorne, Calif.

Sun-Dial—Radiators. Slant-Fin Radiator Corp., Richmond Hill, N. Y.

Sun-Lite-Aire—Sterilizing lamps and units. Sampson Chemical & Pigment Corp., Chicago, Ill.

Sunnybase—Radiation. Crane Co., Chicago Ill.

Sunnyday—Boilers. Crane Co., Chicago, Ill.

Sunnywall—Radiation. Crane Co., Chicago, Ill.

Sunrad—Direct radiation, hangers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Sunray—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.

Super—Transformers, valves. Union Electric & Mfg. Co., Jersey City, N. J.

Super—Vacuum cleaners, dust collectors. Empire Chemical Products Co., Newark, N. J.

Supercutno—Packing. Greene, Tweed & Co., North Wales, Pa.

Super-Diamond—Floor and ceiling plates. Eastern Stainless Steel Corp., Baltimore, Md.

Superector—Wrenches. Williams & Co., J. H., Buffalo, N. Y.

Superex—Pipe, boiler and tank insulation. Johns-Manville, New York, N. Y.

Superfin—Furnaces, heaters. American Foundry & Furnace Co., Bloomington, Ill.

Super-Fine—Insulation and wrap, pipe. L.O.F. Glass Fibers Co., Toledo, O.

Super Finish—Insulation. Refractory & Insulation Corp., New York, N. Y.

Super-Flo—Dehydrators, filters. Remco, Inc., Zelienople, Pa.

Superflo—Heaters. Payne Div. of Carrier Corp., Monrovia, Calif.

Superflux—Solder. Paul-Lewis Laboratories, Inc., Milwaukee, Wis.

Super-Hearth—Refractories and refractory cement. Insul-Lyte Corp., A Div. of Plibrico Co., River Rouge, Mich.

Superior—Fans. American Foundry & Furnace Co., Bloomington, Ill.

Superior—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Superior—Meters. Neptune Meter Co., New York, N. Y.

Super-Jet—Burners. Downing Steel Products, Dayton, O.

Super Light—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.

Superratchet—Ratchet Wrenches. Williams & Co., J. H., Buffalo, N. Y.

Super-Saw—Tools, electric saws. RCS Tool Corp., Bloomington, Ill.

Super 7—V belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Super Silvertop—Traps. The V. D. Anderson Co., Div. of International Basic Economy Corp., Cleveland, O.

Super "66"—Insulation, cement insulating. Eagle-Picher Co., Cincinnati, O.

Super Seal—Valves. Farris Flexible Valve Corp., Palisades Park, N. J.

Supersheat—Gaskets, packing. Greene, Tweed & Co., North Wales, Pa.

Super T—Systems. Tork Time Controls, Inc., Mount Vernon, N. Y.

Supertemp—Insulation. Eagle-Picher Co., Cincinnati, O.

Supertherm—Heating systems. Ross Engineering Corp., J. O., New York, N. Y.

Super Venturi—Fittings. Taco Heaters, Inc., Cranston, R. I.

Super X—Coatings. Nelson Mfg. Co., B. F., Minneapolis, Minn.

Surefit—Ducts and duct fittings, and tin pipe. Henry Furnace Co., Medina, O.

Sure Return—Condensation return pumps. Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., Chicago, Ill.

Sureweld—Electrodes, welders. National Cylinder Gas Co., Chicago, Ill.

Surfamax—Pipe line filters. Micro Metallic Corp., Glen Cove, N. Y.

Sutco—Electric motors. Sutton Corp., O. A., The, Wichita, Kans.

Sweatflow—Valves. Quality Specialty Co., Inc., Camden, N. J.

Swif—Penetrant solvent. Hercules Chemical Co., Inc., New York, N. Y.

Swish—Cleaning compounds. Montgomery Chemical Co., Jenkintown, Pa.

Sylphon—Steam traps. Webster & Co., Warren, Camden, N. J.

Synchro—Operators, orifices, valves. The Bristol Co., Waterbury, Conn.

Synchro-Flame—Burners. Synchronous Flame, Inc., Walworth, Wis.

Synchrogear—Changers. American Flexible Coupling Div., Zurn Industries, Inc., Erie, Pa.

Synchro-Lectric—Viscosimeters. Brookfield Engineering Laboratories, Inc., Stoughton, Mass.

Synchro-Meter—Meters. Bailey Meter Co., Cleveland, O.

Synchron—Motors. Hansen Mfg. Co., Inc., Princeton, Ind.

Syncretizer—Unit ventilators. Nesbitt, Inc., John J., Philadelphia, Pa.

Syncro—Gages, regulators, combustion control systems. Canton Stoker Corp., Canton, O.

Syncrogear—Drives, gear-motors, speed reducers. U. S. Electrical Motors, Inc., Los Angeles, Calif.

Syndolag—Refractories and refractory cement. Basic Inc., Cleveland, O.

Synrub—Wire. United States Rubber Co., New York, N. Y.

Syphonaire—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.

T. T.—Smoke guns. Hill & Co., E. Vernon, Lake Geneva, Wis.

"TW"—Unit coolers. McQuay, Inc., Minneapolis, Minn.

TXT—Valves. Texsteam Corp., Houston, Tex.

Tabasco—Water heaters. Kewanee Boiler Div., American Radiator & Standard Sanitary Corp., Kewanee, Ill.

TAC—Wrenches. Proto Tools, Los Angeles, Calif.

Tall Boy—Heaters. Lennox Industries, Inc., Marshalltown, Ia.

Tampin—Bolts. Star Expansion N. Y., Inc., **New York, N. Y.**

Tanco—Insulation, duct, sound deadening. Thompson and Co., Oakmont, Pa.

Tank-O-Meter—Gages, indicators. Uehling Instrument Co., Paterson, N. J.

Tanktrol—Regulators, switches, sprinkler system controls. Automatic Control Co., St. Paul, Minn.

Tannate—Belting, packing. Rhoads & Sons, J. E., Wilmington, Del.

Tannate-Rockwood—Belt drives. Rhoads & Sons, J. E., Wilmington, Del.

Tapebinder—Industrial tape. Gerrard & Co., A. J., Melrose Park, Ill.

Taper-Lock—Couplings, V-belt drives, pulleys and sheaves. Dodge Mfg. Corp., Mishawaka, Ind.

Tasil—Furnace cement. Taylor Sons Co., Charles, Cincinnati, O.

Tayco-40—Furnace and refractory cement, refractories. Taylor Sons Co., Charles, Cincinnati.

Taycor—Refractories and refractory cement. Taylor Sons Co., The Charles, Cincinnati, O.

Teel—Pumps, circulators. Dayton Electric Mfg. Co., Chicago, Ill.

Teflon—Gaskets. Chicago Gasket Co., Chicago, Ill.

Teflon—Pipe joints, packing. United States Gasket Co., Camden, N. J.

Teflon—Plastics, powder and resins. duPont deNemours & Co., E. I., Polychemicals Dept., Wilmington, Del.

Teksag—Boiler cleaning compounds. Agnew & Tomlinson, Long Island City, N. Y.

Tektolog—Recorders. Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.

Tektor—Switches, alarms. Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.

Tel-A-Pipe—Identification markers for piping. Westline Products Div. of Western Lithograph Co., Los Angeles, Calif.

Telecator—Gages, recorders and recorder-controllers. Automatic Control Co., St. Paul.

Telecode—Relays. Benjamin Electric Mfg. Co., Des Plaines, Ill.

Telescon—Recorders, recorder-controllers. Automatic Control Co., St. Paul, Minn.

Teletrol—Controllers and starters. Airgard Mfg. Co., Chicago, Ill.

Tellevel—Switches. Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., Aurora, Ill.

Telster—Gages, alarms. Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.

Teltru—Anemometers, gages. Hill & Co., E. Vernon, Lake Geneva, Wis.

Temflex—Plastic tubing. Irvington Varnish & Insulator, Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.

Tempchek—Insulation. Philip Carey Mfg. Co., Lockland, Cincinnati, O.

Temp-lo—Insulation. Lockport Mills, Inc., Lockport, N. Y.

Tempmaster—Thermostats. Crown Controls Co., Inc., New Bremen, O.

Tempoint—Thermometers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Temp-R-izer—Burners. Laharco Industries, Minneapolis, Minn.

Temproof—Bases and pads. Lord Mfg. Co., Erie, Pa.

Tempscribe—Recorders. Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Temtrim—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.

Tenite—Plastics. Plastics Div., Eastman Chemical Products, Inc., Kingsport, Tenn.

Tenite-Kralastic—Plastic pipe. Texas Vitrified Pipe Co., Mineral Wells, Tex.

Tensilend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.

Tensulate—Insulation. Tennessee Products and Chemical Corp., Nashville, Tenn.

Tergitol—Water treatment. Carbide and Carbon Chemicals Co., A Division of Union Carbide and Carbon Corp., New York, N. Y.

Termin-o-Seal—Seals. Wolfe Co., Inc., The, Franklin C., Culver City, Calif.

Testite—Fittings. General Fittings Co., East Greenwich, R. I.

Texan—Heaters. Hotstream Heater Co., Cleveland, O.

Texdrive—Pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Texiron—Pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Texrope—V-belt drives, pulleys, v-belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Texslide—Motor bases. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Texolite—Tubing. General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass.

Texway—Bases. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

T-Flo—Dehydrators. Ansul Chemical Co., Refrigeration Div., Marinette, Wis.

T Flow—Valves. Quality Specialty Co., Inc., Camden, N. J.

Tharco—Cement. The Armstrong Co., Detroit.

Thawzone—Dehydrant and acid neutralizer. Stewart Industries, Inc., Clifton, N. J.

Therma-Cal—Nameplates. North Shore Nameplate Co., Bayside, N. Y.
Thermaflex—Connectors, tubing, ducts, and duct fittings, hose. Flexible Tubing Corp., Guilford, Conn.
Therma-Koil—Tubing. Radiant Heat and Cooling Co., Santa Clara, Calif.
Thermalbridge—Thermometers. Thompson Research & Mfg. Co., Davenport, Fla.
Thermalink—Heaters, preheaters. Electro-Therm, Inc., Silver Spring, Md.
Thermal Electric—Systems. Fluid Systems, Inc., New Haven, Conn.
Thermalite—High temperature paint. Tropical Paint Co., Cleveland, O.
Thermasil—Insulation. Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Thermatrol—Valves. Schnacke, Inc., Evansville, Ind.
Thermatube—Pre-insulated pipe. Flexible Tubing Corp., Guilford, Conn.
Thermek—Tubing, aftercoolers, chillers, coils, condensers, coolers, exchangers, surface cooling. Heatron, Inc., York, Pa.
Thermidaire—Furnaces, heaters, air conditioning units. Campbell Co., E. K., Kansas City, Mo.
Thermo—Expansion valves. Alco Valve Co., St. Louis, Mo.
Thermobank—Systems. Kramer Trenton Co., Trenton, N. J.
Thermo-Base—Air diffusers. Gerwin Industries, Inc., Michigan City, Ind.
Thermobestos—Pipe, boiler and tank insulation. Johns-Manville, New York, N. Y.
Thermobloc—Heaters. Prat-Daniel Corp., Thermobloc Div., South Norwalk, Conn.
Thermochek—Controls. Bell & Gossett Co., Morton Grove, Ill.
Thermodulor—Control systems. Carvell Heat Equipment Co., Los Angeles, Calif.
Thermoflex—Strainers, heating systems, radiator orifices, traps, valves. Cashin Co., W. D., Boston, Mass.
Thermo Grip—Torches. Ideal Industries, Inc., Sycamore, Ill.
Thermoguide—Thermometers. Taylor Instrument Companies, Rochester, N. Y.
Thermo-Humidigraph — Recorder-controllers. Bristol Co., The, Waterbury, Conn.
Thermoil-Granodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Thermolator—Valves. Triplex Heating Specialty Co., Inc., Peru, Ind.
Thermolier—Unit heaters. Grinnell Co., Inc., Providence, R. I.
Thermopane—Windows. Libbey-Owens-Ford Glass Co., Toledo, O.
Thermoseal—Windows. Russell Co., F. C., The, Cleveland, O.
Thermoswitch—Thermostats, regulators. Fenwal, Inc., Ashland, Mass.
Therm-o-tile—Conduit. Porter & Co., Inc., H. W., Newark, N. J.
ThermoTrode—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Thermotrol—Valves. Sterling, Inc., Milwaukee, Wis.
Therm-otrols—Thermometers. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Thermovent—Unit ventilators. Nesbitt, Inc., John J., Philadelphia, Pa.
Thermwire—Cables. Wiegand Co., Edwin L., Pittsburgh, Pa.
Thermxchanger—Condensers, converters, coolers, exchangers. Cooley Co., E. C., San Francisco, Calif.
Thick Coat—Protective coatings. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Thick or thin—Cement and compounds. Jet-Lube, Inc., Burbank, Calif.
Thinline—Air conditioning units. General Electric Co., Appliance & Television Receiver Div., Louisville, Ky.
Thin Man—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Thin Tube—Radiation. National-U.S. Radiator Corp., Johnstown, Pa.
Thor—Belting. Goodyear Tire & Rubber Co., Akron, O.
Thorobred cog-belt—V belts and v-belt drives. Dayton Rubber Co., Dayton, O.
Thoro-Mix—Burners. Siemon Mfg. Co., Grandview, Mo.
Thread-Tite—Cement and compounds. Armite Laboratories, Los Angeles, Calif.
Thred-O-Matic "22" & "44"—Machines, Pipe Cutting. Collins Machinery Corp., Los Angeles, Calif.
Thredolets—Fittings. Bonney Forge & Tool Wks., Allentown, Pa.
3C—Motor controls. Clark Controller Co., Cleveland, O.
3M—Cements and compounds, adhesives, insulation. Minnesota Mining & Mfg. Co., St. Paul, Minn.
3 Way Weather-Flo—Thermostats. Automatic Devices Co., Inc., Western Springs, Ill.
Thriftmaster—Convection radiation. General Heating Products Co., Philadelphia, Pa.
Thriftmaster—Water softeners. Modern Div., George Getz Corp., Rockford, Ill.
Throway—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Thur-Ma-Lox—Coatings. Dampney Co. of America, Boston, Mass.
Tico—Galvanized sheet steel. Inland Steel Co., Chicago, Ill.
Tico—Galvanized Sheet Steel. Inland Steel Products Co., Milwaukee, Wis.
Ticotherm—Boilers. Titusville Iron Works Co., The, Titusville, Pa.
Tillotson—Steam traps. Henry Owens & Co., Inc., Cranston, R. I.
Tilt Trap—Steam traps. Nason Co., Clarkston, Mich.
Timercoid—Time switches. Mercoid Corp., Chicago, Ill.
Time-O-Stat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Tin-Ezy—Coatings, solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Tinol—Solder and fluxes. American Solder & Flux Co., Philadelphia, Pa.
Tiny—Traps. Nason Co., Clarkston, Mich.
Titan—Traps. Nason Co., Clarkston, Mich.
Tite Kote—Sheets. Reeves Steel & Mfg. Co., Dover, O.
Tite Seal—Cement and compounds. Radiator Specialty Co., Charlotte, N. C.
Toastmaster—Heaters. McGraw Electric Co., Clark Div., Chicago, Ill.
Tom Thumb Pipe Master—Pipe machines. Oster Mfg. Co., Cleveland, O.
Tonrac—Compressors. American Blower Corp., Detroit, Mich.
Tool-Arc—Electrodes. Alloys Rods Co., York, Pa.
Toolweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Torchmaster—Torches. Deutsch Co., The, Los Angeles, Calif.
Torchweld—Regulators. welding and cutting apparatus. National Cylinder Gas Co., Chicago, Ill.
Tork Grip—Benders. Parker Appliance Co., The, Cleveland, O.
Tork Master—Switches. Tork Time Controls, Inc., Mt. Vernon, N. Y.
Torkotherm—Switches. Tork Time Controls, Inc., Mt. Vernon, N. Y.
Tork Weather Control—Switches. Tork Time Controls, Inc., Mt. Vernon, N. Y.
Torpedo—Dehydrators, filters, strainers. Imperial Brass Mfg. Co., Chicago, Ill.
Torq-Stop—Wrenches. Richmont, Inc., Monrovia, Calif.
Torque-Arm—Reducers. Dodge Mfg. Corp., Mishawaka, Ind.
Totalume—Paint. Wilbur & Williams Co., Brighton, Mass.
Totrust—Protective coatings, enamels and lacquers. Wilbur & Williams Co., Brighton, Mass.
Trace—Refrigerant leak detectors. Stewart Industries, Inc., Clifton, N. J.
Tramrail—Conveyors. Cleveland Crane & Eng. Co., Wickliffe, O.
Transaire—Transmitters. Taylor Instrument Companies, Rochester, N. Y.
Transflex—Plastic tubing. Irvington Varnish and Insulator, Div. of Minnesota Mining and Mfg. Co., Irvington, N. J.
Transhield—Pipe wrap. Johns-Manville, New York, N. Y.
Transite—Conduit, duct connections, pipes, ducts and duct fittings, sheets and board. Johns-Manville, New York, N. Y.
Transparent—Analyzers, gages, kits, meters, switches, testers, tubes, manometers. Dwyer Mfg. Co., F. W., Michigan City, Ind.
Trantex—Adhesives. Johns-Manville, New York, N. Y.
Trap-Dri—Dehydrators. A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Trap-it—Filters, strainers. A-P Controls Div., Controls Corp. of America, Milwaukee, Wis.
Treet-O-Control—Steam system and water treatment, pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Treet-O-Unit—Feeders, pumps, water treatment. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Trentweld—Tubing, pipe. Crucible Steel Co. of America, Pittsburgh, Pa.
Triad—Stocks and dies. Nye Tool Co., Chicago, Ill.
Triangle—Water heater. Day & Night Mfg. Co., Monrovia, Calif.
Tribune—Hose. Continental Rubber Wks., Erie, Pa.
Tri-Clad—Motors. General Electric Co., Apparatus Dept., Schenectady, N. Y.
Trident—Meters. Neptune Meter Co., New York, N. Y.
Tri-Flex—Registers, grilles. Tuttle & Bailey, Div. of Allied Thermal Corp., New Britain, Conn.
Tri-Flux—Motors. Redmond Co., Inc., Owosso, Mich.
Tri-Flux—Solder. Wolfe-Kote Co., Inc., Sheboygan, Wis.
Tri-Guard—Protective coatings. Foster Co., Benjamin, Philadelphia, Pa.
Trimline—Radiation. Vulcan Radiator Co., Hartford, Conn.
Trimo—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Trimo—Pipe wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Trimo Alloy—Pipe wrenches. Trimont Mfg. Co., Div of St. Pierre Chain Corp., Worcester, Mass.
Trimo Spiral Grip—Pipe wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Trimrad—Radiation. Koven & Bro., Inc., L. O., Jersey City, N. J.
Triple-A—Enamels and lacquers, paint, protective coatings. Quigley Co., Inc., New York.
Triple-lok—Fittings. Parker Appliance Co., The, Cleveland, O.
Triple-Seal—Fittings. Imperial Brass Mfg. Co., Chicago, Ill.
Triple Trap—Steam traps. Acker Corp., Meridian, Miss.
Triplex—Stocks and dies. Nye Tool Co., Chicago, Ill.
Tripl-Aire—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
Tri-Rotor—Pumps. Yale & Towne Mfg. Co., Stamford, Conn.
Tri-snap—Thermostats. Westinghouse Electric Corp., Pittsburgh, Pa.
Tri-Sul-Ite—Pipe and tubing insulation. Ziegler & Co., G. S., Great Neck, N. Y.
Triumph—Gages and indicators. Boston Auto Gage Co., Pittsfield, Mass.
Trojan—Boilers. Burnham Corp., Irvington, N. Y.
Trojan—Stokers. Auburn Burner Co., Auburn, Ind.
Tropelite—Coatings. Tropical Paint Co., Cleveland, O.
Tropic-Aire—Air conditioning units. McGraw Electric Co., Clark Div., Chicago.
Tropic-Breeze—Air conditioning units, burners. Dalzen Mfg. Co., St. Clair, Mich.
Tropilux—Enamels and lacquers. Tropical Paint Co., Cleveland, O.
Tru-Air—Air conditioning units, surface, systems, condensers, dehumidifiers, heaters. Blazer & Son, M., Passaic, N. J.
True Heat—Radiation. Pacific Steel Boiler Div., National-U.S. Radiator Corp., Johnstown, Pa.
True-Pitch Levee—Tools. Dreier Bros., Inc., Chicago, Ill.
Truespot—Testers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Truflex—Bi-metals. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Truflex—Drives, v-belts. Gates Rubber Co., The, Denver, Colo.
Tru-Grip—Pulleys and sheaves. Gates Rubber Co., Denver, Colo.
Truk-Cel—Unit coolers. Dole Refrigerating Co., Chicago, Ill.
Truliradiant—Gas burners. Sullivan Valve & Engineering Co., Butte, Mont.
Tru-Perimeter—Heating systems. Webster & Co., Warren, Camden, N. J.
Tru-Set—Fasteners. Ramset Fastening System, Winchester-Western Div., Olin-Mathieson Chemical Corp., Cleveland, O.
Try-Me—Regulators, filters, strainers, valves. Tryco Products, Inc., Westfield, Mass.
Tubecote—Protective coatings. Wilhelm Co., A., Reading, Pa.
Tuff-Bond—Adhesives, cement, insulation. Moore Inc., Goodloe E., Danville, Ill.
Tufflex—Bases and pads, insulation. Wood Conversion Co., St. Paul, Minn.
Tuf-flex—Gage and sight glasses. Libbey-Owens-Ford Glass Co., Toledo, O.
Tuff-Weld—Fasteners, hangers. Moore Inc., Goodloe E., Danville, Ill.
Tuf-On—Protective coatings. Brooklyn Paint & Varnish Co., Inc., Brooklyn, N. Y.
Tulox—Tubing. Extruded Plastics, Inc., Norwalk, Conn.
Tumblin—Bolts. Star Expansion N. Y., Inc., New York, N. Y.
Turbinair—Motors. Joy Mfg. Co., Pittsburgh, Pa.
Turbo—Air washers, spray nozzles. Bayley Blower Co., Milwaukee, Wis.
Turbo-Aire—Overfire air jets, smoke alarms. Canton Stoker Corp., Canton, O.
Turbo-Fire—Burners. Gordon & Piatt, Inc., Winfield, Ks.
Turbo Vane—Fans and blowers. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Turbulaire—Dryers. Western Precipitation Corp., Los Angeles, Calif.
Turcoat—Coatings. Turco Products, Inc., Los Angeles, Calif.
Twin Contact—Systems, thermostats. General Controls Co., Glendale, Calif.
Twindow—Heat insulating windows. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Twin G-Fin—Preheaters. Griscom-Russell Co., Massillon, O.
Twin Seal—Check valves, gage testers. Mansfield & Green, Cleveland, O.
Two-Tank-T—Oil burner filters. Barclay, Inc., Robert, Chicago, Ill.
Tygon—Protective coatings, plastic tubing. United States Stoneware Co., New York, N. Y.

Tygon—Protective coatings, plastic tubing. United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Tylox—Pipe couplings. United States Stoneware Co., New York, N. Y.

U-Brand—Fittings. Union Malleable Mfg. Co., Ashland, O.
USG—Louvers and shutters. United States Gypsum Co., Chicago, Ill.
U. S. S.—Angles, sheets. United States Steel Co., Pittsburgh, Pa.
U. S. S.—Pipe, tubing. National Tube Div., United States Steel Corp., Pittsburgh, Pa.
U-S-S—Sheets, angles. Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
U. S.—Valves. Powell Co., Wm., The, Cincinnati, O.
UXLD—Regulators. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Ucilon—Protective coatings, enamels and lacquers, high temperature paint. Metal & Thermit Corp., Rahway, N. J.
U-Cote—Pipe fittings. Union Malleable Mfg. Co., Ashland, O.
Ugasco—Gaskets. United States Gasket Co., Camden, N. J.
Ultra-Aire—Filters. Mine Safety Appliances Co., Pittsburgh, Pa.
Ultrafine—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Ultralite—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Unarco—Insulation, gaskets, packing, insulating cement, condensers, heaters, radiation, surface cooling & heating, air conditioning units. Union Asbestos & Rubber Co., Chicago, Ill.
Unbrako—Parts for heating & air conditioning equipment, socket screws. Standard Pressed Steel Co., Jenkintown, Pa.
Uni-cast—Motors. Redmond Co., Inc., Owosso, Mich.
Unichrome—Protective coatings, electrolytic devices, enamels and lacquers. Metal & Thermit Corp., Rahway, N. J.
Uniclosed—Electric motors. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Unicoils—Finned surfaces. Clarage Fan Co., Kalamazoo, Mich.
Unicon—Refrigerating condensers. Kramer Trenton Co., Trenton, N. J.
UNIFIL—Connectors. Scully Signal Co., Melrose, Mass.
Uniflare—Fittings. Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Uni-Flo Air Valves—Valves. Barber-Colman Co., Rockford, Ill.
Uni-flo—Diffusers, grilles, regulators, registers. Barber-Colman Co., Rockford, Ill.
Uniflow—Oil burners. Ace Engineering Co., Chicago, Ill.
UniMatic—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.
Union—Valves. Powell Co., Wm., The, Cincinnati, O.
Unipack—Welding fume exhausters, centrifugal fans. American Machine Products Co., Marshalltown, Ia.
Unipar—Cement and compounds. Parker Appliance Co., The, Cleveland, O.
Unipump—Pumps. Weinman Pump Mfg. Co., Columbus, O.
Unishear—Shears. Stanley Works, The, New Britain, Conn.
Unishears—Electric shears. Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Unisorb—Bases and pads. Felters Company, The, Boston, Mass.
Unistage—Aftercoolers. Schramm, Inc., West Chester, Pa.
UniStoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Uni-Strainer—Strainers. Perfecting Service Co., Charlotte, N. C.
Unitair—Air compressors. Joy Mfg. Co., Pittsburgh, Pa.
Unitaire—Air conditioning units. Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Unitem—Heaters. Bell & Gossett Co., Morton Grove, Ill.
Unitherm—Unit heaters. Clarage Fan Co., Kalamazoo, Mich.
Unit Fin—Radiation. Vapor Heating Corp., Chicago, Ill.
Unit-Line—Pumps. Johnston Pump Co., Pasadena, Calif.
UniTrane—Air conditioning units and coolers. Trane Co., The, La Crosse, Wis.
Uni-Trap—Steam traps. Perfecting Service Co., Charlotte, N. C.
Universal—Benders. Hossfeld Mfg. Co., Winona, Minn.
Universal—Cast iron pipe. Central Foundry Co., Newark, N. J.
Universal—Centrifugal pumps. Bell & Gossett Co., Morton Grove, Ill.
Universal—Gas and oil burners. Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., Los Angeles, Calif.
Universal—Packing. Johns-Manville, New York, N. Y.
Universal—Pumps. Wright Mfg. Co., Phoenix, Ariz.
Universal—Regulators. Dockson Corp., Detroit, Mich.
Universal CP—Drills. Chicago Pneumatic Tool Co., New York, N. Y.
Universal Unaflow—Engines. Skinner Engine Co., Erie, Pa.
Uni-Wash—Dust collectors. Newcomb-Detroit Co., Detroit, Mich.
Uno Turbine—Ventilators. Uno Ventilator Co., Malden, Mass.
Uno Venturette—Ventilators. Uno Ventilator Co., Malden, Mass.
Urefoam—Insulating cement, pipe insulation. Atlas Mineral Products Co., Mertztown, Pa.
UsAIRco—Air conditioning equipment, blowers, condensers, fans, surfaces, heaters. United States Air Conditioning Corp., Philadelphia, Pa.
Uscolite—Plastic pipe, fittings, plastic valves. United States Rubber Co., New York, N. Y.
Us-kon—Conductors. United States Rubber Co., New York, N. Y.
Util-i-Torch—Torches. Turner Brass Works, The, Sycamore, Ill.
Utilitube.—Aluminum tubing. Aluminum Co. of America, Pittsburgh, Pa.
Utility—Blowers. American Blower Corp., Detroit, Mich.
Utility—Roof ventilators. Arex Co., Chicago.
Utility—Heaters. Wing Mfg. Co., L. J., New York, N. Y.

VB Reflecto-Batt—Insulation. Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
VL-5—Lubricants. Jet-Lube, Inc., Burbank, Calif.
VP-Ex—Ventilators. New York Blower Co., Chicago, Ill.
V*S—Changers. Reliance Electric & Engineering Co., Cleveland, O.
Vacu-Flo—Fittings. H-P Products, Inc., Louisville, O.
Vacumatic—Ejectors, pumps. Whittington Pump & Engineering Corp., Indianapolis.
Vacuum Cold Plate—Coils and panels. Dole Refrigerating Co., Chicago, Ill.
Vacuumstat—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Valcalox—Dampers, regulators. Young Regulator Co., Cleveland, O.
Valvactor—Valve operators. Foxboro Co., Foxboro, Mass.
Valvent—Roof ventilators. Swartwout Co., Cleveland, O.
Valvrator—Valves. Fischer & Porter Co., Hatboro, Pa.
Vanco—Louvers and shutters. Van Noorden Co., E., Boston, Mass.
Vanco Exhaustmaster—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco "QR"—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Simplex—Ventilators. Van Noorden Co., E., Boston, Mass.
Vanco Upblast—Ventilators. Van Noorden Co., E., Boston, Mass.
Van Cor—Ducts and duct fittings, plastic pipe fittings, plastic pipe, plastic sheets and valves. Colonial Plastics Mfg. Co., Cleveland, O.
Vapco—Compounds. Garman Co., Inc., The, St. Louis, Mo.
Vapco-Phos Nuggets—Water treatment. Garman Co., Inc., The, St. Louis, Mo.
Vapco Slime-X—Water treatment. Garman Co., Inc., The, St. Louis, Mo.
Vape-Sorber—Filters. Selas Corp. of America, Dresher, Pa.
Vaporene—Compound and water treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Vapor-Clarkson—Heating and process boilers. Vapor Heating Corp., Chicago, Ill.
Vaporstat—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Vapowall—Insulation. MMM, Inc., Houston, Tex.
Varia-Speed Drives—Speed changers. Reeves Pully Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind.
Varidrive—Speed changers. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Vari-Pitch—Speed changers, pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Vari-Temp—Air conditioning units. Dunham-Bush, Inc., West Hartford, Conn.
Vari-Vac—Heating systems, control systems. Dunham-Bush, Inc., West Hartford, Conn.
Vaultmaster—Air conditioning units. Haertel Co., Walter, Minneapolis, Minn.
Vcon—Oil. Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Veco—Analyzers, combustion testing kits, Recorders, thermometers. Victory Engineering Corp., Union, N. J.
Veeco—Leak detectors. Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Vee Jet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Veelos—V-belts. Manheim Mfg. & Belting Co., Manheim, Pa.
Velometer—Air velocity meters. Illinois Testing Laboratories, Inc., Chicago.
Velvetrol—Valves. J. D. Gould Co., Indianapolis, Ind.
VENTALARM—Alarms, gages. Scully Signal Co., Melrose, Mass.
Ventbestus—Connections, duct, flexible. Ventfabrics, Inc., Chicago, Ill.
Ventfab—Flexible duct connections. Ventfabrics, Inc., Chicago, Ill.
Ventglas—Connections, duct, flexible. Ventfabrics, Inc., Chicago, Ill.
Vento—Traps. Haines Div., William S., Sellers Injector Corp., Philadelphia.
Ventura—Fans. American Blower Corp., Detroit, Mich.
Venturafin—Unit heaters. American Blower Corp., Detroit, Mich.
Venturi—Fan housings. Commercial Shearing & Stamping Co., Youngstown, O.
Venturi—Meters, nozzles. Builders-Providence, Inc., Div. of B-I-F Industries Inc., Providence, R. I.
Venturi-Flo—Air diffusers. Barber-Colman Co., Rockford, Ill.
Venturi One—Fittings. Taco Heaters, Inc., Cranston, R. I.
Venturi-Top—Caps, roof ventilators. Walker Mfg. & Sales Co., St. Joseph, Mo.
Vent-Vac—Heating systems. Anderson Products, Inc., Cambridge, Mass.
Ventyvinyl—Connections. Ventfabrics, Inc., Chicago, Ill.
Verco—Insulating cement. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Verithin-Microrold—Steel sheets. Washington Steel Corp., Washington, Pa.
Vermiculite—Insulation. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Vernier-Set—Time switches. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Vertiflow—Unit heaters. Young Radiator Co., Racine, Wis.
V-Flat—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.
Vibracork—Bases and pads. Korfund Co., Inc., Long Island City, N. Y.
Vibraducer—Absorbers. Atlantic Metal Hose Co., Inc., New York, N. Y.
Vibraglass—Bases and pads. L. O. F. Glass Fibers Co., Toledo, O.
Vibra grate—Stokers. American Engineering Co., Philadelphia, Pa.
Vibrashock—Bases and pads. Robinson Aviation, Inc., Teterboro, N. J.
Vibra-sorber—Vibration absorbers. Flexonics Corp., Maywood, Ill.
Vibrastop—Duct connections. Grant Wilson, Inc., Chicago, Ill.
Vibration Eliminators—Adsorbers. American Metal Hose Div., American Brass Co., Waterbury, Conn.
Vibro-Hangers—Pipe hangers and supports. Korfund Co., Inc., Long Island City, N. Y.
Vibro Insulators—Bases. Goodrich Co., B. F., Akron, O.
Vibro-Isolators—Bases and pads, vibration absorbers. Korfund Co., Inc., Long Island City, N. Y.
Vichrome—Coatings, enamels. Interchemical Corp., Finishes Div., Newark, N. J.
Victory—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Viking—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
V-in-Tah—Paint. Valdura Div., American-Marietta Co., Chicago, Ill.
Vim—Belting, gaskets, leather packing. Houghton & Co., E. F., Philadelphia, Pa.
Vim Tred—Leather belting. Houghton & Co., E. F., Philadelphia, Pa.
Vinsynite—Coatings. Thompson and Co., Oakmont, Pa.
Vinyl—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.
Visaflame—Controls. Mercoid Corp., The, Chicago, Ill.
Viscograph—Viscosimeters. Brabender Corp., Rochelle Park, N. J.
Viscorator—Viscosimeters. Fischer & Porter Co., Hatboro, Pa.
Visi-Flare—Tools. Parker Appliance Co., The, Cleveland, O.
Visi-Flo—Sight glasses for pipe lines. Jordan Corp., Div. of OPW Corp., Cincinnati, O.
Visi-Float—Air filter gages. F. W. Dwyer Mfg. Co., Michigan City, Ind.
Viso Flo—Sight glasses. O P W Corp., Cincinnati, O.
Visoleak—Leak detectors. Allin Mfg. Co., Chicago, Ill.
Vitalic—Hose. Continental Rubber Wks., Erie, Pa.
Vitalloy—Wrenches. Billings & Spencer Co., Hartford, Conn.

Vitreon—Pipe. Robinson Clay Products Co., Inc., The, Akron, O.
Vitricel—Refractories. Carey Mfg. Co., Philip, The, Lockland, Cincinnati, O.
Vitriram—Furnace cement. United States Stoneware Co., New York N. Y.
Vitroliner—Pipe and fittings, stacks and chimneys. Condensation Engineering Corp., Chicago, Ill.
Vix-Syn—Rubber and synthetic packing. Houghton & Co., E. F., Philadelphia, Pa.
V-Meth-L—Refrigerants. Virginia Smelting Co., West Norfolk, Va.
Volcano—Ventilators. Iwan Brothers, South Bend, Ind.
Volcano—Torches. Deutsch Co., The, Los Angeles, Calif.
Vol-O-Flo—Meters. National Instrument Laboratories, Inc., Riverdale, Md.
Vornado—Fans, air conditioning units. Sutton Corp., O. A., The, Wichita, Kans.
Vortex—Pumps. Lawrence Pump and Engine Co., Lawrence, Mass.
V-to-V—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.
Vulcalock—Linings, tank; lined fittings, pipe and valves, adhesives. Goodrich Industrial Products Co., B. F., Akron, O.
Vulcalock—Fittings, pipe, tanks, valves, Goodrich Co., B. F., Akron, O.
Vulcan—Stands, tongs, vises. Williams & Co., J. H., Buffalo, N. Y.
Vulcan—Stokers. Canton Stoker Corp., Canton, O.
Vulcan Superior—Tongs, vises. Williams & Co., J. H., Buffalo, N. Y.
Vulco—Pulleys. Gates Rubber Co., Denver, Colo.
Vulco Ropes—Belts, drives. Gates Rubber Co., Denver, Colo.
Vulcomount—Pulleys. Gates Rubber Co., Denver, Colo.
Vyflex—Tank linings. Kaykor Industries, Inc., Yardville, N. J.

W. & McD.—Strainers. Watson & McDaniel Co., Philadelphia, Pa.
WS—Valves. Powell Co., Wm., The, Cincinnati, O.
W & T—Chlorinators, feeders, gages, indicators. Wallace & Tiernan Inc., Belleville, N. J.
W.T.E.—Boilers. Murray Iron Works, Co., Burlington, Ia.
WTP—Boilers. Titusville Iron Wks. Co., The, Titusville, Pa.
W & W—Pipe hangers. Western Wire Products Co., St. Louis, Mo.
Waikiki—Heaters. Vapor Heating Corp., Chicago, Ill.
Wakefield—Coils, fittings, pipe, pumps, tanks and valves. Lead Lined Iron Pipe Co., Wakefield, Mass.
Walco-Parmelee—Wrenches. Walworth Co., New York, N. Y.
Walltube—Radiator brackets, or hangers. Arjac Products Inc., Rochester, N. Y.
Walseal—Fittings, valves. Walworth Co., New York, N. Y.
Walvector—Radiation. Webster & Co., Warren, Camden, N. J.
Warco—Fuel oil treatment. Warren Refining & Chemical Co., The, Cleveland, O.
Warcolite—Enamels and lacquers. Warren Refining & Chemical Co., The, Cleveland.
Warnock—Wrenches. Lowell Wrench Co., Worcester, Mass.
Watch Dog—Meters. Worthington-Gamon Meter Div., Worthington Corp., Newark, N. J.
Watco—Cooling towers, systems. Water Cooling Corp., New York, N. Y.
Water-Boy—Feeders, alarms, valves. Maid-O'-Mist, Inc., Chicago, Ill.
Waterfilm—Boilers. Koven & Bros., Inc., L. O., Jersey City, N. J.
Water-King—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Water Master—Filters. Austin Engineering & Mfg. Co., Inc., Ysleta, Tex.
Water-Mund—Heaters. Mund Boilers, Inc., Los Angeles, Calif.
Waterspar—Enamels and lacquers, Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Wa-Trol—Regulators. Thermal Agency, Houston, Tex.
Way Loctor—Doors and panels. Walsh Co., The, L. M., Boston, Mass.
Wear-Arc—Electrodes. Alloy Rods Co., York, Pa.
Wear-Arc "Super WH"—Electrodes. Alloy Rods Co., York, Pa.
Wear-Proof—Pumps. Schneible Co., Claude B., Detroit, Mich.
Wearweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Weather—Protective coatings. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Weather-Chron—Switches, control systems, regulators, thermostats. Automatic Devices Co., Inc., Western Springs, Ill.
Weather-Damper—Regulators. Automatic Devices Co., Inc., Western Springs, Ill.
Weather-Flo—Thermostats, control systems, heating systems, regulators. Automatic Devices Co., Inc., Western Springs, Ill.
Weathermaker—Unit air conditioners. Carrier Corp., Syracuse, N. Y.
Weather-Man—Regulators, thermostats, control systems. Automatic Devices Co., Inc., Western Springs, Ill.
Weatherstat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Weatherwise—Air conditioning units. Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Weber's—Insulation. Forty-Eight Insulations, Inc., Aurora, Ill.
Weco—Plugs, steel unions. Chiksan Co., Brea, Calif.
Wedgbelt—V belts and v-belt drives, pulleys. American Pulley Co., Philadelphia, Pa.
Wedge-Lock—Pipe, fittings. Robinson Clay Product Co., The, Akron, O.
Wedgeplug—Valves. Stockham Valves & Fittings, Birmingham, Ala.
Weir—Stokers. Meyer Furnace Co., The, Peoria, Ill.
Weir-Meyer—Furnaces, heaters. Meyer Furnace Co., The, Peoria, Ill.
Weldaluminite—Welding compounds. Special Chemicals Corp., Ossining, N. Y.
Weldanpower—Welders. Lincoln Electric Co., The, Cleveland, O.
Weldells—Welding fittings. Taylor Forge & Pipe Works, Chicago, Ill.
Weld-Ends—Couplings. Wachs Co., E. H., The, Chicago, Ill.
Weld-Ends—Pipe couplings, fittings. Pipe Line Development Co., Cleveland, O.
Weld-Lok—Pipe fittings. Parker Appliance Co., The, Cleveland, O.
Weldolets—Fittings. Bonney Forge & Tool Works, Allentown, Pa.
Western—Fans, furnaces, heaters. Tuck-Aire Furnace Co., San Francisco, Calif.
Westernaire—Fans. Western Engineering & Mfg. Co., Venice, Calif.
Western Roll-Bond—Heat exchangers. Olin Mathieson Chemical Corp., Metals Div., New York, N. Y.
West-Flex—Bellows, hose. Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Wevelite—Insulation. Insulite Div., Minnesota & Ontario Paper Co., Minneapolis, Minn.
Whiffletree—Valves. Dahl, G. W., Bristol, R. I.
Whirlclad—Coatings. Polymer Corp., The, Reading, Pa.
Whirlcone—Spray nozzles. Water Cooling Equipment Co., St. Louis, Mo.
Whirljet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
White Star—Valves. Powell Co., Wm., The, Cincinnati, O.
Wig-O-Flex—Couplings. Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Wigwam Thermcap—Vent flue caps. Boston Machine Works Co., Lynn, Mass.
Wilco—Bi-metals. Wilson Co., H. A., The, Union, N. J.
Wilco—Pipe cutting machines. Oster Mfg. Co., Cleveland, O.
Wind-A-Clamp—Hose clamps. Manufacturers Corp., Mansfield, O.
Wind-A-Clamps—Hose Clamps. Richland Co., Mansfield, O.
Windial—Anemometers. Friez Instrument Div., Bendix Aviation Corp., Baltimore.
Windmaster—Fans. Acme Equipment Co., Muskogee, Okla.
Wind-O-Cool—Fans. Belco Industries, Inc., St. Louis, Mo.
Wind-O-Vent—Window ventilator and filter units. Reed Unit-Fans, Inc., New Orleans.
Wingfoil—Ventilators, exhausters, and fans. Wing Mfg. Co., L. J., Linden, N. J.
Winkler—Burners, boilers, furnace, stokers, air conditioning units. Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Winter-Chaser—Air conditioning units, furnaces, heaters. Campbell Heating Co., Des Moines, Ia.
Wissco—Grilles. Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., New York, N. Y.
Witch—Bolts, clamps, hangers, protectors. Carpenter & Paterson, Inc., Cambridge, Mass.
Wolf-Linde—Condensers, compressors, fittings, flanges, strainers, valves. Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Wondaire—Heaters. Cox Mfg. Co., Ridgeville, Ind.
Wonder—Pipe benders. American Pipe Bending Machine Co., Inc., Poultney, Vt.
Wonderglas—Heaters. Hotstream Co., Cleveland, O.
Würtzilite—Coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.

X-L—Gaskets, packing. Excelsior Leather Washer Mfg. Co., Rockford, Ill.
Xit—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.
XV Valve—Valves. Farris Flexible Valve Corp., Palisades Park, N. J.
Xyron—Electrodes. Eutectic Welding Alloys Corp., Flushing, N. Y.

YAC—Air conditioning units. Young Radiator Co., Racine, Wis.
Yager's—Solder. Benson Co., Inc., Alex R., Hudson, N. Y.
Yarway—Alarms, clamps, expansion joints, recorders, nozzles, strainers, traps. Yarnall-Waring Co., Philadelphia, Pa.
Yarway Seatless—Valves. Yarnall-Waring Co., Philadelphia, Pa.
Yoloy—Pipe, sheet, tubing. Youngstown Sheet & Tube Co., Youngstown, O.
Yorkaire—Unit air coolers. York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., York, Pa.
Yulatrol—Fuel oil preheaters, leak detectors. Yula Water Heaters, Inc., Bronx, N. Y.

Zaflo—Enamels and lacquers. Atlas Powder Co., Industrial Finishes Dept., North Chicago, Ill.
Zaponite—Enamels and lacquers. Atlas Powder Co., Industrial Finishes Dept., North Chicago, Ill.
Zatex—Enamels and lacquers. Atlas Powder Co., Industrial Finishes Dept., North Chicago, Ill.
Z-Crete—Pipe and concrete insulation. Zonolite Co., Chicago, Ill.
Zebogene—Treatment. Berna Corp., Garwood, N. J.
Zephyrcon—Condensers. Larkin Coils, Inc., Atlanta, Ga.
Zero—Cement, refractories. Standard Fuel Engineering Co., Detroit, Mich.
Zerolite—Pipe insulation. Johns-Manville, New York, N. Y.
Zeropaks—Coolers. McQuay, Inc., Minneapolis, Minn.
Zig Zag—Heat exchangers. Stout & Sons, David, St. Louis, Mo.
Zinaloy—Zinc sheets. Matthiessen & Hegeler Zinc Co., La Salle, Ill.
Zincgrip—Sheets. Armco Steel Corp., Middletown, O.
Zincilate—Coatings. Industrial Metal Protectives, Inc., Dayton, O.
Zincoater—Coatings. Tropical Paint Co., Cleveland, O.
Zinc Soot—Soot destroyers. Tamms Industries Inc., Chicago, Ill.
Zinodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Zip Dyeline Inspector—Piping leak detectors. Zaco Labs., Div. of Zip Abrasive Co., Cleveland, O.
Zipper—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Zip-Portable—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Zip Speed Lacquer—Identification markers. Zaco Labs., Div. of Zip Abrasive Co., Cleveland, O.
Zircon—Furnace and refractory cement, refractories. Taylor Sons Co., Charles, Cincinnati, O.
Zone-Pac—Heating systems. Barber-Colman Co., Rockford, Ill.
Zonetrol—Systems. Crise Controls Div., Acro Mfg. Co., The, Columbus, O.
Zytel—Plastics, powder and resins. duPont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.

DIRECTORY SECTION
HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT
FOR INDUSTRIAL AND ALL OTHER LARGE BUILDINGS
PART 4 — ALL MANUFACTURERS' ADDRESSES

A

A. & A. Register Co., 8327 Clinton Rd., Cleveland 9, O.
ABC-Federal Oil & Burner Co., Inc., 2210 Walnut St., Philadelphia 3, Pa.
ACEC Electric Corp., 40 E. 49th St., New York 17, N. Y.
A.C.M.I. Borescope Div., American Cystoscope Makers, Inc., 1241 Lafayette Ave., New York 59, N. Y.
ACRC Div. Hills-McCanna Co., 3025 N. Western Ave., Chicago 18, Ill.
A'G'A Div. of Elastic Stop Nut Corp. of America, 1027 Newark Ave., Elizabeth 3, N. J.
A-J Mfg. Co., 3601 E. 18th St., Kansas City 27, Mo.
A-P Controls Div., Controls Corp. of America, 2450 N. 32nd St., Milwaukee 45, Wis.
A.R.A. Mfg. Co., 1041 Foch St., Ft. Worth, Tex.
Abart Gear & Machine Co., 4828-36 W. 16th St., Chicago 50, Ill.
Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica 32, N. Y.
Abbott & Biddle Co., 2413-27 Federal St., Philadelphia 46, Pa.
Able Metal Spinning & Stamping Co., 2009 Nameoke Ave., Far Rockaway 91, N. Y.
Accurate Sheet Metal & Mfg. Works, 2336-40 Milwaukee Ave., Chicago 47, Ill.
Ace Engineering Co., 1435 W. 15th St., Chicago 8, Ill.
Ace Instrument Co., Inc., 172 Pacific St., Brooklyn, N. Y.
Acer & Whedon, Inc., Medina, N. Y.
Acheson Mfg. Co., Braddock P. O., Rankin, Pa.
Acker Corp., P. O. Box 3117, No. Sta. P. O., Meridian, Miss.
Ackermann Mfg. Co., Wheeling, W. Va.
Acme Asbestos Covering & Flooring Co., 236 N. Elizabeth St., Chicago 7, Ill.
Acme Electric Corp., Cuba, N. Y.
Acme Electric Welder Co., 2618 Fruitland Ave., Los Angeles 58, Calif.
Acme Equipment Co., 205-13 E. Broadway, Muskogee, Okla.
Acme Industries, Inc., 600 N. Mechanic St., Jackson, Mich.
Acme Mfg. Co., 7500 State Rd., Philadelphia 36, Pa.
Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.
Acme Welding Div. of the United Tool & Die Co., 1031 New Britain Ave., West Hartford, Conn.
Acorn Paint & Chemical Co., 8001 Franklin Ave., Cleveland, O.
Acragage Corp., Wampus Lane, Milford, Conn.
Acro Welder Mfg. Co., 1719 W. St. Paul Ave., Milwaukee 3, Wis.
Adam Electric Co., Frank, 3648 Windsor Pl., St. Louis 13, Mo.
Adams Co., The, E. 4th St., P. O. Box 268, Dubuque, Ia.
Adams Co., Inc., R. P., 468 Park Dr., Buffalo 17, N. Y.
Adams Mfg. Co., 1530 St. Clair Ave., Cleveland 14, O.
Adams Pipe Repair Products, 2453 Merced Ave., P. O. Box 111, El Monte, Calif.
Addison Products Co., Addison, Mich.
Adelta Mfg. Co., Inc., 21 & Ellsworth, Philadelphia 46, Pa.
Adjustable Clamp Co., 417 N. Ashland Ave., Chicago 22, Ill.
Admiral Corp., 3800 Cortland St., Chicago 47, Ill.
Adre Co., The, 8980 W. Warfield Ave., Hales Corner 3, Wis.
Advance Aluminum Castings Corp., 2742 W. 36th Pl., Chicago 32, Ill.
Advance Furnace Co., 2300 E. Douglas, Wichita 7, Kans.
Advance Pump Co., 2531 9th St., Berkeley, Calif.
Advance Relays, Product of Electronics Div., Elgin National Watch Co., 2435 N. Naomi St., Burbank, Calif.
Aemco Inc., 10 State St., Mankato, Minn.
Aerco Corp., Northvale, N. J.
Aero-Coupling Corp., 3015 Winona Ave., Burbank, Calif.
Aerofin Corp., 101 Greenway Ave., Syracuse 3, N. Y.
Aeroil Products Company, Inc., 69 Wesley St., South Hackensack, N. J.
Aeroprojects, Inc., West Chester, Pa.
Aeroquip, Inc., 1225 W. Main St., Van Wert, O.
Aeroquip Corp., 300 S. East Ave., Jackson, Mich.
Aerotec Corp., The, Greenwich, Conn.
Aerovent Fan Co., Inc., Ash and Barlow Sts., Piqua, O.
Aetna Ball & Roller Bearing Co., 4600 W. Schubert, Chicago, Ill.
Agava Products, Inc., 34 Exchange Pl., Jersey City 2, N. J.
Aget-Detroit Co., 613 First National Bldg., Ann Arbor, Mich.
Agnew & Tomlinson, 51-04 Vernon Blvd., Long Island City 1, N. Y.
Ahlberg Bearing Co., 3025 W. 47th St., Chicago 32, Ill.
Air Conditioning Engineering Co., 44 First St., Cambridge 41, Mass.
Air Conditioning Products Co., 2340 W. Lafayette Blvd., Detroit 16.
Air Control Products, Inc., Coopersville, Mich.
Air Controls, Inc., Div. of Cleveland Heater Co., 2310 Superior Ave., Cleveland 14, O.
Air-Cooling Engineering Co., P. O. Box 744, Evanston, Ill.
Aircraft Fitting Co., 11830 Brookpark Rd., Cleveland 30, O.
Air Devices, Inc., 185 Madison Ave., New York 16, N. Y.
Air Distribution Products Co., 116 S. LaBrea Ave., Los Angeles 36, Calif.
Air Equipment Co., 2730 Zuni St., Denver, Colo.
Air-Factors, Inc., 1624 S. Raymond Ave., Monrovia, Calif.
Air Fan Engineering Co., 7401 Telegraph Rd., Los Angeles 22, Calif.
Air Filter Corp., 108 N. Water St., Milwaukee 2, Wis.
Airfloor Co. of California, 8620 Otis St., Southgate, Calif.
Air-Net Appliance Corp., 1340 E. 55th St., Chicago 15, Ill.
Air Reduction Co., Inc., Socony-Mobil Bldg., 150 E. 42nd St., New York 17, N. Y.
Air & Refrigeration Corp., 439 Madison Ave., New York 22, N. Y.
Aireactor Corp., 22 E. 40th St., New York 16, N. Y.
Aire-Foile Fan & Blower Co., 10047 West Fort, Detroit 9, Mich.
Airgard Mfg. Co., 362 W. Erie St., Chicago 10, Ill.
Airguide Instrument Co., 2210 Wabansia Ave., Chicago 47, Ill.
Airjet Ventilator Co., 133 Industrias, San Clemente, Calif.
Airkem, Inc., 241 E. 44 St., New York 17, N. Y.
Airmaster Corp., 1801 W. Belle Plaine Ave., Chicago, Ill.
Airmatic Valve, Inc., 7317 Associate Ave., Cleveland 9, O.
Air-Maze Corp., 25000 Miles Rd., Cleveland 28, O.
Air-Path Products Co., 4620 Doll Ave., Baltimore 15, Md.
Air Purification Service, Inc., 136 Liberty St., New York, N. Y.
Airserco Mfg. Co., Inc., 435 Melwood St., Pittsburgh 13, Pa.
Air-Stream Filter Corp., 2100 Washington Ave., St. Louis 3, Mo.
Airtemp Construction, Div. of Chrysler Corp., 1600 Webster, Dayton, O.
Airtherm Mfg. Co., 711 S. Spring Ave., St. Louis 10, Mo.
Airtron Corp., Holland, O.
Airwasher Corp., Eaton Rapids, Mich.
Ajax Boiler & Heater Co., 1519 W. 132nd St., Gardena, Calif.
Ajax Corp. of America, 2509 Washington Ave., Evansville, Ind.
Ajax Flexible Coupling Co., Westfield, N. Y.
Ajax Furnace Fitting Co., Div. of Cincinnati Sheet Metal & Roofing Co., 216-220 E. Front St., Cincinnati 2, O.
Akron Metallic Gasket Co., 155 N. Union, P. O. Box 911, Akron 9, O.
Alabama Pipe Co., Anniston, Ala.
Aladdin Heating Corp., 1111 West Ave., 137, San Leandro, Calif.
Alan Wood Steel Co., Conshohocken, Pa.
Alberger Heater Div., ADSCO Industries, Inc., 20 Milburn St., Buffalo 12, N. Y.
Albert Pipe Supply Co., Berry & N. 13th, Brooklyn, N. Y.
Albertson & Co., Inc., 3100 Lowell St., Sioux City 2, Ia.
Alco Products, Inc., Schenectady 5, N. Y.
Alco Refrigeration Sales & Service, Inc., 3952 St. Clair Ave., Cleveland, O.
Alco Valve Co., 865 Kingsland Ave., St. Louis 5, Mo.
Aldrich Co., 105 E. Williams St., Wyoming, Ill.
Aldrich Pump Co., 4 Pine St., Allentown, Pa.
Alexander Bros., 406 N. 3rd, Philadelphia, Pa.
Allan Engineering Co., P. O. Box 1211, Dallas, Tex.
Allcraft Mfg. Co., 27 Hayward St., Cambridge, Mass.
Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.
Allegheny Valve Co., 349 Pennsylvania Ave. W., Warren, Pa.
Allen-Bradley Co., 1335 S. First St., Milwaukee 4, Wis.
Allen Co., Inc., L. B., 6702 Bryn Mawr Ave., Chicago 31, Ill.
Allen Co., Robert G., P. O. Box 110, Mechanicsville, N. Y.
Allen Cooler & Ventilator, Inc., 704 Woodward, Rochester, Mich.
Allen Mfg. Co., W. D., 566 W. Lake St., Chicago 6, Ill.
Alliance Industries, Huntingden Valley, Pa.
Alliance Mfg. Co., Inc., Alliance, O.
Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y.
Allied Porcenell, Inc., 851 S. Market St., Waukegan, Ill.
Allied Weld-Craft, Inc., 401 W. South St., Indianapolis 25, Ind.
Allin Mfg. Co., 410 N. Hermitage Ave., Chicago, Ill.
Allington & Curtis Mfg. Co., 1800 Holland Ave., Saginaw, Mich.
Allis-Chalmers Mfg. Co., 1171 S. 70th St., Milwaukee 1, Wis.
Allis Co., Louis, The, 427 E. Stewart St., Milwaukee 1, Wis.
Allmetal Screw Products Co., Inc., 821 Stewart Ave., Garden City, Long Island, N. Y.
Alloy Propeller, Zelienople, Pa.
Alloy Rods Co., Lincoln Highway West, York, Pa.
Alloy Stainless Products Co., Union Blvd., Totowa, N. J.
Alloy Steel Products Co., 1322 W. Elizabeth Ave., Linden, N. J.
Allpax Co., Inc., Mamaroneck, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Alpha Metals, Inc., 56 Water St., Jersey City, N. J.
Alpha Plastics, Inc., 78 Okner Pkwy., Livingston, N.J.
Alphil Spot Welding Co., 1058 Pacific St., Brooklyn, N. Y.
Alrose Chemical Co., Box 1294, Providence 1, R. I.
Alstrom Corp., The, 790 E. 176 St., New York 60, N. Y.
Alton Mfg. Co., 1112 Ross Ave., Dallas 2, Tex.
Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.
Aluminum Wool Div., Carey Electronic Engineering Co., 1880 Clifton Ave., Springfield, O.
Alumiseal Corp., 429 E. 53rd St., New York 22, N. Y.
Amana Refrigeration, Inc., Amana, Ia.
Amco Plastic Pipe Co., 2002 Davis St., San Leandro, Calif.
Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.
American Agile Corp., P. O. Box 168, Bedford, O.
American Air Curtain, 10408 Manchester Rd., St. Louis 22, Mo.

American Air Filter Co., Inc., 373 Central Ave., Louisville 8, Ky.
American Air Filter Co., Inc., Herman Nelson Products, 215 Central Ave., Louisville 8, Ky.
American Boa, Inc., 114 Liberty St., New York, N.Y.
American Blow Pipe Co., 3549 W. Cermak Rd., Chicago 23, Ill.
American Blower Corp., Detroit 32, Mich.
American Brass Co., 414 Meadow St., Waterbury 20, Conn.
American Car & Foundry Div. of ACF Industries, Inc., 30 Church St., New York 8, N. Y.
American Cast Iron Pipe Co., 2930 N. 16th St., Birmingham 2, Ala.
American Chemical Paint Co., Brookside Ave., Ambler, Pa.
American Coal Burner and Wood Stoker Corp., 1133 W. Cornelia Ave., Chicago 13, Ill.
American Coils Co., 360 Thomas St., Newark 5, N. J.
American Coolair Corp., 3604 Mayflower St., P. O. Box 2300, Jacksonville 3, Fla.
American Cooling Tower Co., 2710 McGee St., Kansas City 8, Mo.
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
American District Steam Div., ADSCO Industries, Inc., 20 Milburn St., Buffalo 12, N. Y.
American District Telegraph Co., 155 Sixth Ave., New York, N. Y.
American Engineering Co., Wheatsheaf Lane & Sepviva St., Philadelphia 37, Pa.
American Felt Co., Glenville, Conn.
American Flange & Mfg. Co., Inc., 30 Rockefeller Plaza, New York 20.
American Flexible Coupling Div., Zurn Industries, Inc., 1810 Pittsburgh Ave., Erie, Pa.
American Flow Control Corp., 2220 South Blvd., Houston, Tex.
American Foundry & Furnace Co., Washington St. at McClun, Bloomington, Ill.
American Furnace Co., 1300 Hampton Ave., St. Louis 10, Mo.
American Gas & Chemicals, Inc., Leak-Tec Div., 120 East End Ave., New York 28, N. Y.
American Gilsonite Co., 134 W. Broadway, Salt Lake City 1, Utah
American Hair & Felt Co., Room 322, Merchandise Mart, Chicago 54, Ill.
American Hard Rubber Co., 93 Worth St., New York 13, N. Y.
American Hydrotherm Corp., 33-70 12th St., Long Island City 6, N. Y.
American Hydrovac, Div. Pitz Foundry Inc., 290 Scholes St., Brooklyn 6, N. Y.
American Instrument Co., Inc., 8030 Georgia Ave., Silver Spring, Md.
American K. A. T. Corp., Garwood, N. J.
American Ladder & Scaffold Co., Inc., 5503 N. W. 7th Ave., Miami 38, Fla.
American Machine Products Co., 208½ S. 2nd Ave., Marshalltown, Ia.
American Machine Wks., Inc., 1320 Clark St., Racine, Wis.
American Manganese Bronze Co., Rhawn & Hegerman Sts., Philadelphia, Pa.
American-Marsh Pumps, Inc., 60 Capital Ave., N. E., Battle Creek, Mich.
American Metal Hose Div., American Brass Co., The, 698 S. Main St., Waterbury 20, Conn.
American Metal Works, Inc., P. O. Box 7027, New Orleans, La.
American Meter Co., Inc., 13500 Philmont Ave., Philadelphia 16, Pa.
American Moistening Co., 260 W. Exchange St., Providence, R. I.
American Molding Co., 355 Fremont St., San Francisco, Calif.
American Nickeloid Co., 113 Second St., Peru, Ill.
American Photocopy Equipment Co., 1920 W. Peterson Ave., Chicago 26, Ill.
American Pipe Bending Machine Co., Inc., 17 Furnace St., Poultney, Vt.
American Pipe & Steel Corp., 2201 W. Commonwealth Ave., Alhambra, Calif.
American Pipe Tool Co., 4856 W. Kinzie St., Chicago 44, Ill.
American Platinum Wks., 231 New Jersey Railroad Ave., Newark, N. J.
American Potash & Chemical Corp., Aerosol & Refrigeration Div., 3100 E. 26th St., Los Angeles, Calif.
American Pulley Co., The, 4200 Wissahickon Ave., Philadelphia 29.
American Radiator & Standard Sanitary Corp., P.O. Box 1226, Pittsburgh 30, Pa.
American Sand-Banum Co., Inc., Meadow Brook National Bank Bldg., Freeport, N. Y.
American Sanitary Mfg. Co., 308 Latimer St., Abingdon, Ill.
American Screw Co., Willimantic, Conn.
American Solder & Flux Co., 19th and Willard Sts., Philadelphia 40, Pa.
American Standard, Air Conditioning Div., 40 W. 40th St., New York, N. Y.
American Steel Band Co., P. O. Box 565, Pittsburgh, Pa.
American Steel & Wire Div., United States Steel, Rockefeller Bldg., Cleveland 13, O.
American Thermal Industries, Inc., 440 Illinois, Detroit 1, Mich.
American Tube Products, Inc., Riverdale Bldg., Natick, R. I.
American Warming & Ventilating Co., 1017-1021 Summit St., Toledo 4, O.
American Water Softener Co., Lehigh Ave. and 4th St., Philadelphia 33, Pa.
American Wells Wks., 100 N. Broadway, Aurora, Ill.
American Zinc Products Div., Ball Brothers Co., Greencastle, Ind.
Ames Iron Works, Inc., Oswego, N. Y.
Amic Mfg. Corp., 21-25 44th Ave., Long Island City, N. Y.
Aminco Refrigeration Products, American Injector Co., 1000 E. McNichols, Detroit 3, Mich.
Ammco Tools, Inc., North Chicago, Ill.
Ammerman Co., Inc., 110 N. 2nd St., Minneapolis 1, Minn.
Amp Corp., 2921 Locust St., St. Louis, Mo.
Ampco Metal, Inc., 1745 S. 38th St., Milwaukee 46, Wis.
Ampion Corp., 4-88 47th Ave., Long Island City 1, N. Y.
Analytical Measurements, Inc., 585 Main St., Chatham, N. J.
Anchor Coupling Co., 342 N. 4th., Libertyville, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., P. O. Box 311, New Albany, Ind.
Anchor Metal Co., Inc., 966 Meeker Ave., Brooklyn, N. Y.
Anchor Packing Co., 401 N. Broad St., Philadelphia 8, Pa.
Andale Co., 1740 Cherry St., Philadelphia 3, Pa.
Andersen Corp., Bayport, Minn.
Anderson Co., V. D., The, Div. of International Basic Economy Corp., 1949 W. 96th St., Cleveland 2, O.
Anderson Chemical Co., Inc., 1620 Waterville Rd., Macon, Ga.
Anderson Deisel Engine Co., 6245 State Rd., Philadelphia 35, Pa.
Anderson Metals Corp., Twenty-Second & Harrison Sts., Kansas City 8, Mo.
Anderson Products, Inc., 17 Tudor St., Cambridge 39, Mass.
Anderson-Stolz Corp., 1731 Walnut St., Kansas City 8, Mo.
Anemostat Corp. of America, 10 E. 39th St., New York 16, N. Y.
Anesite Co., 3575 Touhy Lincolnwood, Skokie, Ill.
Anetsberger Bros., Inc., Northbrook, Ill.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Anthony Co., End of Baker, Streator, Ill.
Anti-Friction Bearings Co., 2020 S. Figueroa St., Los Angeles 7, Calif.
Applied Mechanics Co., 381 Congress St., Boston 10, Mass.
April Showers Co., Inc., 4126 Eighth St., N. W., Washington 11, D. C.
Aqua Electric Scale Control, Inc., 2026 E. 22nd St., Cleveland 15, O.
Aqua Matic, Inc., 2412 Grant, Rockford, Ill.
Aquatrol Ferr-X Corp., Clifton, N. J.
Aquatrol Laboratories, Inc., Clifton, N. J.
Arabol Mfg. Co., 110 E. 42nd St., New York 17, N. Y.
Arcee Products, Pawtucket, R. I.
Arco Co., The, 7301 Bessemer Ave., Cleveland 27, O.
Arcos Corp., 1500 S. 50th St., Philadelphia 43, Pa.
Arens Controls, Inc., 2017 Greenleaf St., Evanston, Ill.
Arex Co., 612 N. Michigan Ave., Chicago 11, Ill.
Argo Industries, Inc., 524 Wetherfield Ave., Hartford, Conn.
Arjac Products Inc., 55-59 Halstead St., Rochester 10, N. Y.
Armart Mfg. Co., 103 Hawthorne Ave., Pittsfield, Mass.
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Armco Steel Corp., 703 Curtis St., Middletown, Ohio.
Armite Laboratories, 6609 Broad St., Los Angeles 1, Calif.
Armour and Co., Ammonia Div., 1355 W. 31st St., Chicago 9, Ill.
Armstrong Bros. Tool Co., 5200-5300 W. Armstrong Ave., Chicago 30.
Armstrong Co., The, 241 S. Post St., Detroit 17, Mich.
Armstrong Co., Richard M., Westchester, Pa.
Armstrong Cork Co., 4400 Concord St., Lancaster, Pa.
Armstrong Furnace Co., Div. of Union Electric Corp., 851 W. 3rd Ave., Columbus, O.
Armstrong Machine Wks., 874 Maple St., Three Rivers, Mich.
Arro Expansion Bolt Co., N. Boone Ave., Marion, O.
Arrow-Hart & Hegeman Elec. Co., 103 Hawthorne St., Hartford 6, Conn.
Arrowhead Rubber Co., 2300 Curry St., Long Beach, Calif.
Art Valve Co., 4662 N. Lincoln Ave., Chicago 25, Ill.
Asbestos Asphalt Insulation Co., 2100 W. Fullerton Ave., Chicago 47.
Ashburn Supply Co., 8468 Warner Dr., Culver City, Calif.
Ashcraft Co., J. P., 5643 Dyer St., Dallas 6, Tex.
Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Associated Plastic Co's., Inc., Midland, Mich.
Associated Valve & Engineering Co., 1150 W. Marquette Rd., Chicago.
Aston Products, Inc., 22804 Dequindre, Hazel Park, Mich.
Atkins Saw Div., Borg-Warner Corp., 402 S. Illinois St., Indianapolis 9, Ind.
Atkomatic Valve Co., Inc., 545 W. Abbott St., Indianapolis 25, Ind.
Atlantic Engravers, Inc., 52 Ocean Ave., Amityville, N. Y.
Atlantic Metal Hose Co., Inc., 308 Dyckman St., New York 34, N. Y.
Atlantic Pipe Bending & Fabricating Corp., Route 17 near Moonachie Ave., P. O. Box 157, Wood-Ridge, N. J.
Atlantic Steel Boiler Co., S. E. Cor. 22nd & Washington Ave., Philadelphia 46, Pa.
Atlantic Steel Co., P. O. Box 1714, Atlanta 1, Ga.
Atlas Industries, Inc., P. O. Box 8152, Houston, Tex.
Atlas Mfg. Co., Eustis at Robbins St., St. Paul 14, Minn.
Atlas Mineral Products Co., Mertztown, Pa.
Atlas Powder Co., Industrial Finishes Dept., North Chicago, Ill.
Atlas Valve Co., 282 South St., Newark, N. J.
Atlas Welding Accessories, Inc., 707 E. Lewiston Ave., Ferndale 20, Mich.
Atmos Corp., 1215 West Fullerton Ave., Chicago 14, Ill.
Auburn Burner Co., Lock Box 269, Auburn, Ind.
Auburn Foundry Inc., Heating Div., Auburn, Ind.
Auburn Machine Works, Inc., Auburn, Neb.
Auburn Sparkplug Co., Inc., Auburn, N. Y.
Auer Register Co., 6600 Clement Ave., Cleveland 5, O.
Aurora Pump Div., The New York Air Brake Co., 619 Loucks St., Aurora, Ill.
Austin Corp., Robert, 51 Albany St., Boston 11, Mass.
Austin Engineering & Mfg. Co., Inc., 8935 San Jose Rd., Ysleta (El Paso County), Texas
Au-Temp-Co Corp., 657 Broadway, New York 12, N. Y.
Auto-Control Laboratories, 5665 Selmaraine Drive, Culver City, Calif.
Autoclave Engineers Sales Corp., 2930 W. 22nd St., Erie, Pa.
Automatic Burner Corp., 1823 W. Carroll Ave., Chicago 12, Ill.
Automatic Control Co., 995 University Ave., St. Paul 4, Minn.
Automatic Corp., 4417 Oleatha Ave., St. Louis 16, Mo.
Automatic Devices Co., Inc., 714 Hillgrove Ave., Western Springs, Ill.
Automatic Gas Equipment Co., 301 Brushton Ave., Pittsburgh 21, Pa.
Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.

Autostributor Co., 226 Leslie St., Lansing 12, Mich.
Auto-Therm Mfg. Co., 6400 E. Seven Mile, Detroit 34, Mich.
Avon Tube Div., Higbe Mfg. Co., Ewing Rd., Rochester, Mich.
Ayres, Inc., 1017 Rosine St., Houston, Tex.

B

Babbift Chemical Co., 36 Prospect St., New Bedford, Mass.
Babbitt Steam Specialty Co., 1 Babbitt Sq., New Bedford, Mass.
Babcock & Wilcox Co., The, Boiler Div., 161 E. 42nd St., New York 17, N. Y.
Babcock & Wilcox Co., The, Tubular Products Div., Beaver Falls, Pa.
Bacharach Industrial Instrument Co., 7301 Penn Ave., Pittsburgh 8.
Badger Fire Extinguisher Co., Chase St., Methuen, Mass.
Badger Mfg. Co., 230 Bent St., Cambridge 41, Mass.
Badger Sales Co., Inc., 2251 W. Pico Blvd., Los Angeles 6, Calif.
Badham Insulation Co., Inc., 1909 — 1st Ave. S., Birmingham, Ala.
Bahnson Co., 1001 S. Marshall St., Winston-Salem 1, N. C.
Bailey Co., Chas. M., 667 Folsom St., San Francisco 7, Calif.
Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, O.
Bakelite Co., Div. of Union Carbide & Carbon Chemical Corp., 30 E. 42nd St., New York, N. Y.
Baker Co., Inc., Maplewood, Me.
Baker & Co., Inc., 113 Astor St., Newark 2, N. J.
Baker & Co., R. H., 2070 Slauson Ave., Huntington Park, Calif.
Baker Mfg. Co., Wichita Falls, Tex.
Bal-Air, Inc., 1210 McGavock St., Nashville, Tenn.
Baldor Electric Co., 4353 Duncan Ave., St. Louis 10, Mo.
Baldwin-Hill Co., 500 Breunig Ave., Trenton 2, N. J.
Baldwin Ward Mfg. Co., 1630 S. Main, Ottawa, Ks.
Balloffet Nozzle Co., Inc., 6825 Adams St., Guttenberg, N. J.
Balteau Electric Corp., New & Meadow Sts., Stamford, Conn.
Baltimore Aircoil Co., Inc., Baltimore 3, Md.
Banister Co., Inc., 23 Charles St., Cambridge 41, Mass.
Barber-Colman Co., 1300 Rock St., Rockford, Ill.
Barber Mfg. Co., 1058 E. 134th St., Cleveland 10, O.
Bar-Brook Mfg. Co., Inc., 6133 Linwood Ave., Shreveport, La.
Barclay, Inc., Robert, 1236 W. Fulton St., Chicago 7, Ill.
Barco Mfg. Co., 500 Hough St., Barrington, Ill.
Bard Mfg. Co., Bryan, O.
Barkow Mfg. Co., Inc., Aug. G., 2230 South 43rd St., Milwaukee 46.
Barksdale Valves, 5125 Alcoa Ave., Los Angeles 58, Calif.
Barnebey-Cheney Co., Cassady at East 8th Ave., Columbus 19, O.
Barnes & Jones, Inc., 34 Crafts St., Newtonville, Mass.
Barnes Manufacturing Co., Mansfield, O.
Barnes Tool Co., The, 152 Brewery St., New Haven 6, Conn.
Barreled Sunlight Paint Co., 43 Dudley St., Providence 1, R. I.
Barrett Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
Barrett Haentjens & Co., Hazleton, Pa.
Barrows Porcelain Enamel Corp., Langdon Farm Rd. & Pa. R. R., Cincinnati, O.
Barry Blower Co., 3100 California St., N.E., Minneapolis, Minn.
Barry Controls, Inc., 765 Pleasant St., Watertown 72, Mass.
Bart Mfg. Corp., 227 Main St., Belleville 9, N. J.
Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit 2, Mich.
Barton Instrument Corp., 1429 S. Eastern Ave., Los Angeles 22, Calif.
Barwick Mfg. Corp., 317 E. 18th, Wichita, Kan.
Baseline Mfg. Co., 2701 E. 78th St., Minneapolis 23, Minn.
Basford Co., H. R., 235 15th St., San Francisco, Calif.
Basic Engineers, Inc., 1834 Main St., Pittsburgh, Pa.
Basic Inc., 845 Hanna Bldg., Cleveland 15, O.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bate Soot Blower Div., General Blower Co., Inc., 6412 Girard Ave., Philadelphia 31, Pa.
Bath Co., Cyril, The, 32400 Aurora Rd., Solon, O.
Bausch & Lomb Optical Co., 633 St. Paul St., Rochester 2, N. Y.
Bayer Co., 4030 Chouteau Ave., St. Louis 10, Mo.
Bayley Blower Co., 6600 W. Burnham St., Milwaukee 14, Wis.
Beach-Russ Co., 50 Church St., New York 7, N. Y.
Beacon-Morris Corp., 60 Brainerd Rd., Allston, Boston 34, Mass.
Beaird Co., J. B., 6200 St. Vincent Ave., Shreveport, La.
Bear Mfg. Co., Industrial Div., 2030 5th Ave., Rock Island, Ill.
Bearing Co. of America, Div. of Federal-Mogul-Bower Bearings, Inc., 501 Harrisburg Ave., Lancaster, Pa.
Beaton & Cadwell Mfg. Co., 185 Main St., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Beaver Advance Corp., Ellwood City, Pa.
Beaver Pipe Tools, Inc., 310 Dana Ave., Warren, O.
Becher Pump Co., 3067 N. Elston, Chicago 18, Ill.
Beckett & Co., Inc., Thomas, 2521 Willowbrook Rd., P. O. Box 13,245, Dallas 9, Tex.
Beckett Corp., R. W. Elyria, O.
Beckley Perforating Co., 301 North Ave., Garwood, N. J.
Beckman & Whitley, Inc., 985 San Carlos Ave., San Carlos, Calif.
Belco Industrial Equipment Div., Bogue Electric Mfg. Co., 100 Pennsylvania Ave., Paterson 3, N. J.
Belco Industries, Inc., 3830-32 Olive St., St. Louis 8, Mo.
Belknap Mfg. Co., Div. of Detroit Controls, 800 Union Ave., Bridgeport 1, Conn.
Bell & Gossett Co., 8200 N. Austin Ave., Morton Grove, Ill.
Belmont Packing & Rubber Co., The, Butler & Sepviva Sts., Philadelphia 37, Pa.
Belmont Smelting & Refining Wks., Inc., 349 Belmont Ave., Brooklyn 7, N. Y.
Beltran Associates, Inc., 1133 East 35th St., Brooklyn 10, N. Y.
Bemco, Inc., 11631 Vanowen St., North Hollywood, Calif.
Bendix-Westinghouse, Automotive Air Brake Co., 950 E. Virginia St., Evansville, Ind.
Benjamin Air Rifle Co., 1527 S. 8th St., St. Louis 4, Mo.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Benson Co., Inc., Alex R., 1040 Bay Rd., So., Hudson, N. Y.
Bergen Pipesupport Corp., 50 Church St., New York 7, N. Y.
Berger Bros. Co., 229-237 Arch St., Philadelphia 6, Pa.
Berger Div., Republic Steel Corp., 1038 Belden Ave., Canton 5, O.
Berko Electric Mfg. Co., 212-40 Jamaica Ave., Queens Village 28, N. Y.
Berna Co., A. J., 15251 Twelve Mile Rd., Roseville, Mich.
Berna Corp., P. O. Box 66, Garwood, N. J.
Bernard-Franklin Co., Inc., 3126 E. Hedley St., Philadelphia 37, Pa.
Bernz Co., Otto, Driving Park & Ramona, Rochester 13, N. Y.
Berry-Hill Corp., Hill Diesel Engine Div., 1 Washington Ave., Providence, R. I.
Bertram Co., Harvey P., The, 561 Reading Rd., Cincinnati 2, O.
Bertsch & Co., Inc., Church St., Cambridge City, Ind.
Besser Metal Products Corp., 754 Clement Ave., Charlotte, N. C.
Best Combustion Equipment Co., Inc., W. N., 415 11th St., Carlstadt, N. J.
Bete Fog Nozzle Inc., 309 Wells St., Greenfield, Mass.
Bethlehem Steel Co., Bethlehem, Pa.
Bettcher Plastics Co., 1951 N. W. Wilson St., Portland, Ore.
Beverly Shear Mfg. Co., 3019 W. 111th St., Chicago 43, Ill.
Bica Co., 1170 N. State St., Girard, O.
Biersach & Niedermeyer Co., 1937 N. Hubbard St., Milwaukee 12.
Bigelow Co., The, 174 River St., New Haven 3, Conn.
Bigelow Liptak Corp., 13300 Puritan Ave., Detroit 27, Mich.
Biggs Boiler Wks. Co., The, 1007 Bank St., E. Akron 5, O.
Biglin & Co., Inc., H. C., 177 Harris, Atlanta, Ga.
Bignall & Keeler Div., John Ramming Machine Co., 4591 McRee Ave., St. Louis 10, Mo.
Billings & Spencer Co., 1 Laurel St., Hartford 1, Conn.
Binks Mfg. Co., 3114-40 Carroll Ave., Chicago 12, Ill.
Birchfield Boiler, Inc., 2503 E. 11th St., Tacoma 1, Wash.
Bird-Archer Co., 4337 North American St., Philadelphia 40, Pa.
Birks Mfg. Co., 811 Hanover Rd., Meriden, Conn.
Bishop & Babcock Mfg. Co., 4901 Hamilton Ave., Cleveland 14, O.
Bituminous Coal Institute, Southern Bldg., Washington 5, D. C.
Black & Decker Mfg. Co., The, 628 Pennsylvania Ave., Towson 4, Md.
Black Mfg. Co., The, 70 Okner Parkway, Livingston, N. J.
Black, Sivalls & Bryson, Inc., 7500 E. 12th St., Kansas City 26, Mo.
Black & White Chemical Co., 130 Walnut Ave., New York 54, N. Y.
Blackhawk Mfg. Co., 5325 W. Rogers St., Milwaukee 1, Wis.
Blackmer Pump Co., 1809 Century Ave., S. W., Grand Rapids 9, Mich.
Blaw Knox Co., Buflovak Equipment Div., 50 Winchester Ave., Buffalo 11, N. Y.
Blaw Knox Co., Power Piping and Sprinkler Div., 829 Beaver Ave., Pittsburgh 33, Pa.
Blazer & Son, M., 173 Market St., Passaic, N. J.
Blissfield Mfg. Co., Blissfield, Mich.
Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich.
Blossom Mfg. Co., Inc., 915 Broadway, New York 10, N. Y.
Blower Application Co., 3165 N. 30th St., Milwaukee 16, Wis.
Blue Ridge Talc Co., Inc., Henry, Va.
Blue Seal Chemical Co., 177 Westfield Ave., W., Roselle Park, N. J.
Bluffton Electric Co., Bluffton, Ind.
Bock Corp., 110 S. Dickinson St., Madison, Wis.
Bodine Electric Co., 2254 W. Ohio St., Chicago 12, Ill.
Bohn Aluminum & Brass Corp., 1400 Lafayette Bldg., Detroit, Mich.
Bohn Aluminum & Brass Corp., Betz Div., Danville, Ill.
Boiler Engineering & Supply Co., Manavon Rd., Phoenixville, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Bonair Products, Inc., 517 Ellis St., Darby, Pa.
Bonney Forge & Tool Wks., Cedar & Meadow Sts., Allentown, Pa.
Bordo Co., Inc., L. J., 115 New St., Glenside, Pa.
Borm Mfg. Co., 23 N. Union St., Elgin, Ill.
Boston Auto Gage Co., 70 West St., Pittsfield, Mass.
Boston Gear Works, Quincy 71, Mass.
Boston Machine Works Co., 7 Willow St., Lynn, Mass.
Boston Woven Hose & Rubber Co., 29 Hampshire St., Cambridge.
Botfield Refractories Co., Swanson & Clymer Sts., Philadelphia 47, Pa.
Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Bowen Engineering, Inc., North Branch, N. J.
Bowerston Shale Co., The, P.O. Box 2, Bowerston, O.
Bowman Co., D. F., 315 W. Main St., New Albany, Ind.
Boylston Steam Specialty Co., 116-122 W. Illinois St., Chicago, Ill.
Brabender Corp., Rochelle Park, N. J.
Brady Co., W. H., 727 W. Glendale Ave., Milwaukee 9, Wis.
Brandes Co., 2046 Winnebago, Madison 4, Wis.
Brandt & Co., Inc., Eugene J., 50-20 25th St., Long Island City 1, N. Y.
Brass & Copper Imports, Inc., 4410 W. Lake Harriet Blvd., Minneapolis, Minn.
Breeze Corporations, Inc., Union, N. J.
Breidert Co., G. C., P. O. Box 1190, San Fernando, Calif.
Bremil Mfg. Co., 1020 Holland St., Erie, Pa.
Bressler Engineering Service, Oregon, Ill.
Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn.
Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., 155 Hill St., Milford, Conn.
Brisk Metal Products, 103 Park Ave., New York 17, N. Y.
Bristol Co., The, P. O. Box 1790, Waterbury 20, Conn.

Broad Crane & Engineering Service Co., 779 S. Dumfries, Detroit 17, Mich.
Broan Mfg. Co., Inc., 926 W. State, Hartford, Wis.
Bronson Fan Mfg. Corp., 4560 Worth St., Los Angeles, Calif.
Bronze Bearings, Inc., 340 North Ave., Cranford, N. J.
Brook Motor Corp., 3553 W. Peterson Ave., Chicago 45, Ill.
Brooke Engineering Co., Inc., 4517 Wayne Ave., Philadelphia 44, Pa.
Brookfield Engineering Laboratories, Inc., 240 Cushing St., Stoughton, Mass.
Brooklyn Paint & Varnish Co., Inc., 50 Jay St., Brooklyn 1, N. Y.
Brooks Equipment Corp., 217 Hudson St., Hoboken, N. J.
Brooks Rotameter Co., Lansdale, Pa.
Brookside Corp., McCordsville, Ind.
Bros Boiler & Mfg. Co., Wm., 1057 10th Ave., S. E. Minneapolis 14.
Brown Co., 150 Causeway St., Boston, Mass.
Brown-Brockmeyer Co., Inc., P. O. Box 989, Dayton 1, O.
Brown-Electro Co., 17 N. Dewey, Oklahoma City 2, Okla.
Brown Fintube Co., The, Elyria, O.
Brown Products Corp., 97-12 Metropolitan Ave., Forest Hills, N. Y.
Browning Mfg. Co., 1940 Browning Blvd., Maysville, Ky.
Brundage Co., The, 503 N. Park St., Kalamazoo 11, Mich.
Bruner Corp., 4763 N. 32nd St., Milwaukee, Wis.
Bruning Co., Inc., Charles, 4700 Montrose Ave., Chicago 41, Ill.
Brunner Co., The, Rt. 129, Athens Rd., Gainesville, Ga.
Brunner Mfg. Co., 1821 Broad St., Utica 1, N. Y.
Bryan Steam Corp., P. O. Box 337, Peru, Ind.
Bryant, Div. of Carrier Corp., 2020 Montcalm St., Indianapolis, Ind.
Bryant Industrial Products Corp., 17700 Miles Ave., Cleveland 28, O.
Bubar Dust Systems, Old Lyme, Conn.
Buckeye Furnace Pipe Co., The, 897 Ingleside, Columbus 8, O.
Buckeye Tools Corp., P. O. Box 966, Dayton 1, O.
Buda Div., The, Allis-Chalmers Mfg. Co., Harvey, Ill.
Budlew Products Co., 3535 W. Cortland, Chicago, Ill.
Buell Engineering Co., Inc., 70 Pine St., New York 5, N. Y.
Buensod-Stacey, Inc., 45 W. 18th St., New York 11, N. Y.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Buffalo Forge Co., 171 Mortimer St., Buffalo 5, N. Y.
Buffalo Meter Co., 2917 Main St., Buffalo 14, N. Y.
Buffalo Pumps, Inc., Div. of Buffalo Forge Co., 171 Mortimer St., Buffalo 5, N. Y.
Buffalo Tank Corp., South Ave., Dunellen, N. J.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., 381 Harris Ave., Providence 1, R. I.
Bullard Co., The, Canfield Ave., Bridgeport 2, Conn.
Bundy Tubing Co., 8109 E. Jefferson Ave., Detroit 14, Mich.
Bunker Hill Co., The, Sales & Fabrication Div., 2700 16th Ave., S. W., Seattle 4, Wash.
Burden Co., Alan E., 1940 Pontius Ave., Los Angeles 34, Calif.
Burdett Mfg. Co., 4920 S. Monitor, Chicago 38, Ill.
Burdett Oxygen Co. of Calif., 2014 Belgrave Ave., Huntington Park, Calif.
Burgess-Manning Co., Architectural Products Div., 5970 Northwest Highway, Chicago 31, Ill.
Burgess-Thomas Co., 17 James St., Bloomfield, N. J.
Burke Electric Co., Div. of Marathon Electric Mfg. Corp., 1201 W. 12th St., Erie, Pa.
Burke Engineering, 1824 S. Burlington, Los Angeles 6, Calif.
Burkhart Engineering Associates, Inc., 536 Commonwealth Ave., Boston.
Burling Instrument Co., Air Conditioning Div., 16 River Rd., Chatham, N. J.
Burnham Corp., Main St., Irvington, N. Y.
Burrows Mfg. Co., F. A., P. O. Box 725, York, Pa.
Burt Mfg. Co., 41 E. South St., Akron 11, O.
Burtchaell Heating Co., 2944 S. E. Powell, Portland, Ore.
Bury Compressor Co., 18th & Cascade Sts., Erie, Pa.
Buxton Mfg. Co., Dover, N. J.
By-Buk Co., 4314 West Pico Blvd., Los Angeles 19, Calif.
Byers Co., A. M., Clark Bldg., Pittsburgh 22, Pa.
Byron Jackson Pumps, Inc., A Subsidiary of Borg-Warner Corp., P. O. Box 2017, Terminal Annex, Los Angeles 54.

C

C C Pump Mfg. Div., Market-Madison Sts., Palmyra, N. J.
CCA Products, Inc., P. O. Box 671, Glendale 5, Calif.
C & H Air Conditioning Fan Co., Inc., 1603 DeKalb Ave., N. E., Atlanta 6, Ga.
C.L.B. Co., 2645 Huldy, P. O. Box 8427, Houston, Tex.
Cabot, Inc., Samuel, 141 Milk St., Boston 9, Mass.
Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25.
Calculator Specialties Co., 122 S. Michigan Ave., Chicago 3, Ill.
Caldwell Co., W. E., 2120 Brook St., Louisville, Ky.
Calgon, Inc., Hagan Bldg., Pittsburgh 30, Pa.
California Brass Mfg. Co., 1447 Naud St., Los Angeles 12, Calif.
California Steel Products Div., Barrett Ave. & A St., Richmond, Calif.
Caliputer, P. O. Box 586, Rancho Santa Fe, Calif.
Cambridge Filter Corp., 738 Erie E. Blvd., Syracuse 3, N. Y.
Camco Products Inc., 445 State St., North Haven, Conn.
Cameron Iron Works, Inc., P. O. Box 1212, Houston, Tex.
Cam-loc Div., Empire Products, Inc., P. O. Box 98, Cincinnati 36, O.
Camloc Fastener Corp., 22 Spring Valley Rd., Paramus, N. J.
Campbell Co., E. K., Manchester at 18th, Kansas City 26, Mo.
Campbell Co., J. A., 645 E. Wardlaw Rd., Long Beach 7, Calif.
Campbell Heating Co., 3121 Dean Ave., Des Moines 17, Ia.
Campco Div., Chicago Molded Products Corp., 2717 N. Normandy Ave., Chicago, Ill.
Cam-Stat, Inc., Div. of The Paul Henry Co., 11833 West Olympic Blvd., Los Angeles 64, Calif.
Cannon Chemical Co., Inc., 181 Portland St., Cambridge 41, Mass.
Canton Stoker Corp., 2400 Andrew Place, S. W., Canton 1, O.
Canvas Products Co., 2115 Locust St., St. Louis 3, Mo.
Capewell Mfg. Co., 60 Governor St., Hartford 2, Conn.
Capitol Mfg. & Supply Co., 153 W. Fulton St., Columbus, O.
Caranth Co., 411 Eichelberger, St. Louis, Mo.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Carboline Co., The, 331 Thornton Ave., St. Louis 19, Mo.
Cardox Corp., 307 N. Michigan Ave., Chicago, Ill.
Carey Electronic Engineering Co., Metal Wool Div., 1880 Clifton Ave., Springfield, O.
Carey Mfg. Company, Philip, Wayne Ave., Lockland, Cincinnati 15, O.
Cargocaire Engineering Corp., 15 Park Row, New York 38, N. Y.
Carlen Associates, 40 West 57th St., New York, N. Y.
Carlin Co., The, Wethersfield, Conn.
Carling Turbine Blower Co., 8 Nebraska St., Worcester Mass.
Carlon Products Corp., 10225 Meech Ave., Cleveland 5, O.
Carlson Rules Branch, Henry Disston Div., H. K. Porter Co., Inc., 1617 California St., Monrovia, Calif.
Carnes, Inc., John R., Greenlawn Ave. & Erie R. R., Lima, O.
Carnes Corp., Verona, Wis.
Carney Co., Inc., The, Mankato, Minn.
Carolina Aniline & Extract Co., 301 S. Cedar St., Charlotte, N. C.
Carolina Blower Co., Inc., 428-436 Morehead Ave., Greensboro, N. C.
Carpenter Heating & Stoker Co., 2135 St. Clair Ave., Cleveland 14, O.
Carpenter Monolithic Floating Ice Rink Floor Co., Suite 9, 1560 Ansel Rd., Cleveland 6, O.
Carpenter & Paterson, Inc., 18 Hurley St., Cambridge 41, Mass.
Carpenter Sales Corp., 4545 E. 71st St., Cleveland 5, O.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Carpenter Valve Corp., The, 6723 Denison Ave., Cleveland 2, O.
Carrier Corp., 300 S. Geddes St., Syracuse 1, N. Y.
Carter Controls, Inc., 2800 Bernice Road, Lansing, Ill.
Carty & Moore Engineering Co., 1150 W. Baltimore Ave., Detroit 2, Mich.
Carvell Heat Equipment Co., 1217 Temple St., Los Angeles 26, Calif.
Carver Pump Co., 1460 Hershey Ave., Muscatine, Ia.
Cash Co., A. W., P. O. Box 551, Decatur, Ill.
Cash Valve Mfg. Corp., A. W., 6621 E. Wabash Ave., Decatur, Ill.
Cashin Co., W. D., 69 A. St., Boston 27, Mass.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Cauhorn Distributing Co., 20722 W. Seven Mile, Detroit 19, Mich.
Ceilheat, Inc., 5212 Homberg Drive, Knoxville, Tenn.
Celanese Corp. of America, 180 Madison Ave., New York 16, N. Y.
Celotex Corp., The, 120 S. La Salle St., Chicago 3, Ill.
Cement Lined Pipe Co., 93 Brookline St., Lynn, Mass.
Central Die Casting & Mfg. Co., Inc., 2935 W. 47th St., Chicago, Ill.
Central Foundry Co., Murray & Pacific Sts., Newark 5, N. J.
Central States Steel Boiler Co., 4649 W. Harrison St., Chicago 44, Ill.
Central Station Steam Co., 2920 E. Woodridge St., Detroit 7, Mich.
Central Steel & Wire Co., P. O. Box 5610-A, Chicago 80, Ill.
Central Transformer Corp., Pine Bluff, Ark.
Central Wire & Iron Works, 621 E. Locust St., Des Moines, Ia.
Centrifix Corp., 3608 Payne Ave., Cleveland 14, O.
Centri-Spray Corp., 39001 Schoolcraft Rd., Livonia, Mich.
Century Electric Co., 1806 Pine St., St. Louis 3, Mo.
Century Engineering Corp., 401-431 3rd St., S. E., Cedar Rapids, Ia.
Century Fan & Ventilator Co., 41 Cedar St., Stamford, Conn.
Century Instrument Co., 220 East Milwaukee St., Detroit, Mich.
Cepi-American, Inc., 7001-3 North Ave., Oak Park, Ill.
Certified Furnace Corp., P. O. Box 1059, Trenton 8, N. J.
Chace Co., W. M., 1606 Beard Ave., Detroit 9, Mich.
Chain Belt Co., 4621 W. Greenfield, Milwaukee 1, Wis.
Chamberlin Co. of America, 1254 La Brosse St., Detroit 32, Mich.
Champion Blower & Forge Co., Harrisburg Ave., and Charlotte St., Lancaster, Pa.
Champion Furnace Pipe Co., 215 Eaton St., Peoria 3, Ill.
Champion Pneumatic Machinery Co., 825 N. Pleasant St., Princeton, Ill.
Chaplin-Fulton Mfg. Co., 5800 Grand Ave., Pittsburgh 25, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Springfield, Mass.
Char-Gale Mfg. Co., 4325 Hiawatha Ave., Minneapolis 6, Minn.
Chase Brass & Copper Co., 236 Grand St., Waterbury 20, Conn.
Chelsea Fan & Blower Co., Inc., 639 South Ave., Plainfield, N. J.
Chelsea Metal Stamping Co., 95 8th Ave., New York 11, N. Y.
Chemical Coatings & Engineering Co., West Chester Pike, Edgemont, Pa.
Chemical Sales Div., Firestone Plastics Co., Pottstown, Pa.
Chemical Solvent Co., 3005 N. 16th St., Birmingham, Ala.
Chempump Corp., 1300 E. Mermaid Lane, Philadelphia 18, Pa.
Chemurgic Process Corp., 55 West 42nd St., New York, N. Y.
Cheney Flashing Co., 623 Prospect St., Trenton 5, N. J.
Chesapeake & Ohio Railway Co., Terminal Tower, Cleveland 1, O.
Chesflex Corp., 684 Nepperhan Ave., Yonkers, N. Y.
Chester Cable Corp., Chester, N. Y.
Chesterton Co., A. W., 6 Ashland St., Everett 49, Mass.
Chicago Belting Div., Chicago-Allis Mfg. Corp., 113-125 N. Green St., Chicago 7, Ill.
Chicago Blower Corp., 9867 Pacific Ave., Franklin Park, Ill.
Chicago Bridge & Iron Co., 332 S. Michigan Ave., Chicago 4, Ill.
Chicago Die Casting Mfg. Co., 2510-14 W. Monroe St., Chicago 12, Ill.
Chicago Expansion Bolt Co., 1338 W. Concord Pl., Chicago 22, Ill.
Chicago Float Works, Not Inc., Dept. T., 2330 S. Western Ave., Chicago 8, Ill.
Chicago Forging and Mfg. Co., 2000 Southport Ave., Chicago 14, Ill.
Chicago Gasket Co., 1271 West North Ave., Chicago 22, Ill.
Chicago Metal Mfg. Co., 3724 S. Rockwell St., Chicago 32, Ill.

Chicago Nipple Mfg. Co., 1616 S. Laramie Ave., Cicero 50, Ill.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Chicago Pump Co., Subsidiary of Food Machinery & Chemical Corp., 622 Diversey Pkwy., Chicago 14, Ill.
Chicago Specialty Mfg. Co., 2954 Lawrence Ave., Chicago 25, Ill.
Chicago Steel Furnace Company, 9326 S. Anthony Ave., Chicago 17, Ill.
Chicago Steel Tank Co., Div. of U. S. Industries, Inc. 6400 W. 66th, Chicago 38, Ill.
Chicago-Wilcox Mfg. Co., 7701 Avalon Ave., Chicago 19, Ill.
Chiksan Co., Brea, Calif.
Childers Mfg. Co., 3620 W. 11th St., Houston 8, Tex.
Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., 1600 Webster St., Dayton 1, O.
Cincinnati Electrical Tool Co., The, P. O. Box 68, Station F, Cincinnati 8, O.
Cincinnati Metalcrafts Inc., 5000 Brotherton Rd., Cincinnati 9, O.
Cincinnati Shaper Co., Hopple, Garrard and Elam, Cincinnati 25, O.
Circle-Air Industries, Inc., 244 Herkimer St., Brooklyn 16, N. Y.
Circle Clamp Corp., 39 Broadway, New York 6, N. Y.
Circle Seal Products Co., Inc., 2181 E. Foothill Blvd., Pasadena 8, Calif.
Circuit Protective Devices Dept., General Electric Co., Woodford Ave., Plainville, Conn.
Cissell Mfg. Co., W. M., 831 South First St., P. O. Box 1143, Louisville 1, Ky.
Clarage Fan Co., Porter St., Kalamazoo 16, Mich.
Clark Bros. Bolt Co., Milldale, Conn.
Clark Bros. Co., Div. of Dresser Operations, Inc., 600 Lincoln St., Olean, N. Y.
Clark Controller Co., 1146 E. 152nd St., Cleveland 10, O.
Clark Dust Control Co., 210 N. Mozart St., Chicago, Ill.
Clark Mfg. Co., 1830 E. 38th St., Cleveland 14, O.
Claronex Products, Inc., 239 Java St., Brooklyn 22, N. Y.
Clauss Cutlery Co., Fremont, O.
Cla-Val Co., 17th & Placentia, Newport Beach, Calif.
Clay Equipment Corp., Cedar Falls, Ia.
Clayton & Lambert Mfg. Co., 1701 Dixie Hwy., Louisville 10, Ky.
Clayton Mfg. Co., 401 N. Temple City Blvd., El Monte, Calif.
Clayton Mark & Co., 1900 Dempster, Evanston, Ill.
Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.
Cleveland Brass Mfg. Co., The, 4606 Hamilton Ave., Cleveland, O.
Cleveland Crane & Eng. Co., 5866 E. 289th St., Wickliffe, O.
Cleveland Fuel Equipment Co., 1111 Brookpark Rd., Cleveland 9, O.
Cleveland Graphite Bronze Co., 17000 St. Clair Ave., Cleveland 10, O.
Cleveland Heater Co., The, 2310 Superior Ave., Cleveland 14, O.
Cleveland Humidifier Co., 7802 Wade Park Ave., Cleveland 3, O.
Cleveland Punch & Shear Works Co., E. 40th and St. Clair Ave., Cleveland 14, O.
Cleveland Worm & Gear Co., 3249 E. 80th St., Cleveland 4, O.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., 152 Grove St., Waltham 54, Mass.
Climax Metal Products Co., 863 E. 140 St., Cleveland 10, O.
Clime-Matic Corp., Connecticut & Richards Ave., South Norwalk, Conn.
Clinton Metallic Paint Co., Clinton, N. Y.
Clipper Mfg. Co., 65 E. 28th St., Kansas City 8, Mo.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Clock & Timer Dept., General Electric Co., Homer Ave., Ashland, Mass.
Clover Industries, Inc., 528 Young St., Tonawanda, N. Y.
Clow & Sons, Inc., James B., 201-299 N. Talman Ave., Chicago 12, Ill.
Clyde Tube Forgings Co. of America, Inc., Foot of S. W. Gibbs St., Portland 1, Ore.
Cobell Industries, P. O. Box 1157, Ft. Worth, Tex.
Cobra Metal Hose Div., 4640 W. 54th St., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Brook St., P. O. Box 176, Elmwood 10, Conn.
Cochrane Corp., 3131 N. 17th St., Philadelphia 32, Pa.
Coe Mfg. Co., Bank St., Painesville, O.
Coen Co., 40 Boardman Pl., San Francisco 3, Calif.
Coffin Co., Jr., J. S., 326 S. Dean St., Englewood, N. J.
Coffing Hoist Div., Duff-Norton Co., Danville, Ill.
Cole-Sewell Engineering Co., 2288 University Ave., St. Paul 4, Minn.
Coleman Co., Inc., The, 250 N. St. Francis St., Wichita 1, Kans.
Collins Machinery Corp., 5474 Alhambra Ave., Los Angeles 32, Calif.
Colonial Plastics Mfg. Co., 2685 E. 79th St., Cleveland 4, O.
Color-Art Printing & Stationery Co., 201 South Kirkwood, Kirkwood 22, Mo.
Colt Ventilation Co. of America, Inc., 4652 Hollywood Blvd., Los Angeles 27, Calif.
Columbia Boiler Company of Pottstown, Pottstown, Pa.
Columbia Engineering Service Co., 4025 Sebastopol Hiway, Santa Rosa, Calif.
Columbia-Geneva Steel Div., United States Steel Corp., 120 Montgomery St., San Francisco 6, Calif.
Columbian Vise & Mfg. Co., 9021 Bessmer, Cleveland, O.
Columbus Steam Pump Wks. Co., 724 W. Gay St., Columbus 8, O.
Combustion Control Div., Electronics Corp. of America, 77 Broadway, Cambridge 42, Mass.
Combustion Engineering Inc., 200 Madison Ave., New York 16, N. Y.
Combustion Equipment Co., 1202 15th St., Moline, Ill.
Comfort Products Inc , P. O. Box 8568, 440 Hillburn Dr., Dallas 2, Tex.
Commercial Filters Corp., 2 Main St., Melrose 76, Mass.
Commercial Plastics Co., 2812 W. North Ave., Chicago 47, Ill.
Commercial Shearing & Stamping Co., 1775 Logan, P. O. Box 719, Youngstown 1, O.
Commercial Solvents Corp., 260 Madison, New York, N. Y.
Commercialaire, Inc., 300 Pacific St., Brooklyn 1, N. Y.
Committee on Steel Pipe Research, American Iron and Steel Institute, 150 E. 42nd St., New York 17, N. Y.
Commonwealth Brass Corp., 5781-5835 Commonwealth Ave., Detroit 8, Mich.
Condensation Engineering Corp., 3511 W. Potomac Ave., Chicago 31.
Condenser Service & Engineering Co., Inc., 150 Observer Highway, Hoboken, N. J.
Conditioned Air, Inc., P. O. Box 2429, Charleston, W. Va.
Cone-Drive Gears Div., Michigan Tool Co., 7171 E. McNichols, Detroit 12, Mich.
Congress Drives Div., Tann Corp., 3750 E. Outer Drive, Detroit 34, Mich.
Conneaut Plastic Metallic Packing Co., Conneaut, O.
Connor Engineering Corp., Danbury, Conn.
Conoflow Corp., Subsidiary of Walworth Co., Dept. P, 2100 Arch St., Philadelphia 3, Pa.
Consolidated Metal Products Corp., Albany, N. Y.
Continental Air Filters, Inc., Box 1647, Louisville 1, Ky.
Continental Can Co., Millsplastic Pipe Div., 100 E. 42nd St., New York 17, N. Y.
Continental-Diamond Div. of The Budd Co. Inc., Newark, Del.
Continental Electric Co., Inc., 323 Ferry St., Newark, N. J.
Continental Electric Equipment Co., 205 W. 4th St., Cincinnati 2, O.
Continental Machine Co., 1952-54 Maud Ave., Chicago 14, Ill.
Continental Products Co., 1150 E. 222nd St., Euclid 17, O.
Continental Radiant Glass Heating Corp., 1 E. 35th St., New York 16.
Continental Rubber Wks., 1935 Liberty St., Erie, Pa.
Continental Screw Co., Mt. Pleasant St., New Bedford, Mass.
Continental Steel Corp., 1108 S. Main St., Kokomo, Ind.
Contour Marker Corp., 1843 E. Compton Blvd., Compton 2, Calif.
Controlair Mfg. Co., 1932 S. Compton Ave., Los Angeles, Calif.
Control Corp. of America, Soreng Div., 9555 Soreng Ave., Schiller Park, Ill.
Convector Corp. of America, 52 Canal St., Washington, D. C.
Convector Manufacturers Ass'n., 2159 Guardian Bldg., Detroit 26, Mich.
Cook Co., Loren, 227 Depot St., Berea, O.
Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Cool-Ette, Inc., 20080 James Couzens Hwy., Detroit 35, Mich.
Cooley Co., E. C., 1186 Folsom St., San Francisco, Calif.
Cooper Alloy Corp., Bloy St. & Ramsey Ave., Hillside, N. J.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Cooper Hewitt Electric Co., 72-732 Grand St., Hoboken, N. J.
Copeland Refrigeration Corp., Sidney, O.
Copes-Vulcan Div., Blaw-Knox Co., 939 West 26th St., Erie 4, Pa.
Coppus Engineering Corp., 344 Park Ave., Worcester 2, Mass.
Coral Designs, Div. of Henry G. Dietz Co., 12-16 Astoria Blvd., Long Island City 2, N. Y.
Corbman Bros., Inc., 25th & York St., Philadelphia, Pa.
Cordo Chemical Corp., 34 Smith St., Norwalk, Conn.
Corite Products, Inc., 6553 W. George St., Chicago 34, Ill.
Corley Co., Inc., The, Plainville, Conn.
Corley Co., Inc., The, 220 W. 42nd St., New York 36, N. Y.
Corning Glass Works, Corning, N. Y.
Cornish-Rutland Co., Williamstown, Mass.
Corrosion Control Co., Inc., 516 Fifth Ave., New York 36, N. Y.
Corrosite Div., Reliance Paint Co., 64 So. 6th St., Brooklyn, N. Y.
Corro-Vent, Inc., 510 Mercantile Library Bldg., Cincinnati 2, O.
C-O Two Fire Equipment Co., Newark, N. J.
Coughlan Co., G. N., West Orange, N. J.
Couplings Co., 2205 W. Roosevelt Rd., Chicago 8, Ill.
Cox Mfg. Co., Ridgeville, Ind.
Cramer Controls Corp., Centerbrook, Conn.
Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
Crane Packing Co., 6458 Oakton St., Morton Grove, Ill.
CraneVeyor Corp., 1240 S. Boyle Ave., Los Angeles 23, Calif.
Crawford Co., 3220 W. 31st St., Chicago 23, Ill.
Crawford Fitting Co., 884 East 140th St., Cleveland 10, O.
Crescent Plastics, Inc., 955 Diamond Ave., Evansville, Ind.
Crescent Tool Co., 230 Harrison St., Jamestown, N. Y.
Crise Controls Div., Acro Mfg. Co., The, 2040 E. Main St., Columbus, O.
Croll-Reynolds Engineering Co., Inc., 17 John St., New York 38, N. Y.
Croll & Son, Jesse G., 2326-2606 Germantown Ave., Philadelphia, Pa.
Crosby Steam Gage & Valve Co., 43 Kendrick St., Wrentham, Mass.
Crotty Mfg. Corp., 133-15 35th Ave., Flushing, L. I., N. Y.
Crown Controls Co., Inc., 40-44 S. Washington St., New Bremen, O.
Crown Die & Tool Corp., 108 N. Jefferson St., Chicago 6, Ill.
Crown Engineer Corp., Locust St., Keyport, N. J.
Crucible Steel Co. of America, Oliver Bldg., P. O. Box 88, Pittsburgh 30, Pa.
Cryer Trap & Valve Div., Encor Corp., 28 Joralemon St., Belleville, N. J.
Crystalheat Co., Van Nuys, Calif.
Culligan Inc., Northbrook, Ill.
Cuno Engineering Corp., 78 S. Vine St., Meriden, Conn.
Curtis Mfg. Co., Refrigeration Div., 1950 Kienlen Ave., St. Louis 20, Mo.
Custom Engineering Co., 406 S. Main St., Los Angeles 13, Calif.
Custom Mfg. Co., 4105 W. Fullerton Ave., Chicago 39, Ill.
Cutler-Hammer, Inc., 421 N. 12th St., Milwaukee 1, Wis.
Cybertronic Corp. of America, Third & Morton Ave., Chester, Pa.
Cyclotherm Div., National-U. S. Radiator Corp., 157 E. First St., Oswego, N. Y.

D

Dahl, G. W., 430 High St., Bristol, R. I.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., 628 Somerville Ave., Somerville 43, Mass.
Dalzen Mfg. Co., 525 South Riverside, St. Clair, Mich.
Damascus Tube Co., Greenville, Pa.
Dampney Co. of America, 50 Business St., Hyde Park, Boston, Mass.

Dana Fan & Blower Corp., 2644 Colerain Ave., Cincinnati 23, O.
Darcoid Co., Inc., 145 Sixth Ave., New York 13, N. Y.
Darling Valve & Mfg. Co., 701 First St., Williamsport, Pa.
Dart Union Co., 134 Thurbers Ave., Providence 5, R. I.
Das Div. of The Zeller Corp., Fort Wayne Rd., Defiance, O.
Davey Compressor Co., Kent, O.
Davidson Co., M. T., 7 Dey St., New York 7, N. Y.
Davidson Hyduty Roof Fan Co., 213 California St., Newton, Mass.
Davis Engineering Corp., 1070 E. Grand St., Elizabeth 4, N. J.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., 201 Halleck St., Newark 4, N. J.
Davis Regulator Co., 2546 S. Washtenaw Ave., Chicago 8, Ill.
Davison Chemical Co., Div. of W. R. Grace & Co., 101 N. Charles St., Baltimore 3, Md.
Day Co., The, 810-830 Third Ave., N. E., Minneapolis 13, Minn.
Day & Night Mfg. Co., 700 Royal Oaks Dr., Monrovia, Calif.
Dayton Automatic Stoker Co., 30 Deeds, Dayton, O.
Dayton Electric Mfg. Co., 126 S. Oakley Blvd., Chicago 12, Ill.
Dayton Rogers Mfg. Co., 2824 13th Ave. S., Minneapolis 7, Minn.
Dayton Rubber Co., 2342 W. Riverview Ave., Dayton 1, O.
Daytronic Corp., 216 S. Main St., Dayton 2, O.
Dean Brothers Pumps, Inc., 323 W. 10th St., Indianapolis 7, Ind.
Dean Hill Pump Co., 4000 E. 16th St., Indianapolis 7, Ind.
Deansteel Products Co., 111 Merchants St., San Antonio, Tex.
Dean Thermo-Panel Coil Div., Dean Products, Inc., 616 Franklin Ave., Brooklyn 38, N.Y.
Dearborn Chemical Co., Merchandise Mart Plaza, Chicago 54, Ill.
Dearborn Stove Co., 1700 W. Commerce St., P. O. Box 5527, Dallas 2, Tex.
Dearborn Tape & Label Co., P. O. Box 4119, N. E. Station, Dearborn, Mich.
Debevoise Co., The, 74-84 20th St., Brooklyn 32, N. Y.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Decatur Pump Co., 2750 Nelson Park Rd., Decatur, Ill.
Deepfreeze Appliance Div., Motor Products Corp., North Chicago, Ill.
Deering Air Conditioning Co., The, 1069 Celestial St., Cincinnati 2, Ohio.
Defender Instrument & Regulator Co., Boody, Ill.
De Laval Steam Turbine Co., 871 Nottingham Way, Trenton 2, N. J.
Delavan Mfg. Co., 811 Fourth Ave., West Des Moines, Ia.
Delco Appliance Div., General Motors Corp., P. O. Box 230, Rochester 1, N. Y.
Delco Products Div., General Motors Corp., 329 E. First St., Dayton 1, O.
Delta Heating Corp., Cole St. & Reading R. R., Trenton 8, N. J.
Delta Welder Corp., 8525 Livernois, Detroit 4, Mich.
Deltron, Inc., 2905 Leithgow St., Philadelphia, Pa.
Deming Co., 14 Aetna St., Salem, O.
Demo-Haines Tool Corp., P. O. Box 1485, Enid, Okla.
Demuth & Sons, Inc., Charles, 245 Elm Place, Mineola, L. I., N. Y.
Denbo Engineering & Sales Co., Inc., 3301 Martindale Ave., Indianapolis.
Dennis Chemical Co., 2701 Papin, St. Louis, Mo.
Dersch, Gesswein & Neuert, Inc., 4849 W. Grand Ave., Chicago 39, Ill.
Desmond-Stephan Mfg. Co., Urbana, O.
Desomatic Products, Inc., 1109 W. Broad St., Falls Church, Va.
d'Este Div., Kaye & MacDonald, Inc., 11-15 Central Ave., West Orange, N. J.
De-Tec-Tronic Corp., 2512 N. Halsted St., Chicago, Ill.
Detroit Blower Corp., 9867 Pacific Ave., Franklin Park, Ill.
Detroit Controls Corp., 5900 Trumball Ave., Detroit 8, Mich.
Detroit Deisel Engine Div., General Motors Corp., 13400 W. Outer Dr., Detroit 28, Mich.
Detroit Float & Stamping Co., 625 Monroe, Detroit, Mich.
Detroit Hoist Machine Co., 8200 Morrow St., Detroit 11, Mich.
Detroit Stamping Co., 350 Midland Ave., Detroit 3, Mich.
Detroit Stoker Co., 1510 East 1st St., Monroe, Mich.
Detroit Valve Co., Div. of Anderson Brass Co., 100 S. Campbell, Detroit 9, Mich.
Deutsch Co., The, 7000 Avalon Blvd., Los Angeles 3, Calif.
Devco Engineering, Inc., Passaic Ave. & Pier Lane, Caldwell, N. J.
Devices, Inc., A Div. of Miracle Adhesives Corp., 214 E. 53 St., New York 22, N. Y.
DeVilbiss Co., The, 300 Phillips Ave., Toledo 1, O.
Devine Mfg. Co., Inc., J. P., 49th and A.V.R.R., Pittsburgh 1, Pa.
De Zurik Shower Co., Sartell, Minn.
Diamond Expansion Bolt Co., Inc., 500 North Ave., Garwood, N. J.
Diamond Machine Tool Co., 5111 Coffman-Pico Rd., Pico, Calif.
Diamond Mfg. Co., 253 W. Eighth St., Wyoming, Pa.
Diamond Power Specialty Corp., P. O. Box 415, Lancaster, O.
Diceler Div. of General Machine & Mfg. Co., Blair St. and Spring Garden Ave., Berwick, Pa.
Dickson Co., The, 742 Woodlawn Ave., Chicago 19, Ill.
Diehl Mfg. Co., Finderne Plant, 1106 Finderne Ave., Somerville, N. J.
Dielectric Products Co., Inc., 125 Virginia Ave., Jersey City 5, N. J.
Diesel Oil Burner Corp. of New York, 105-20 New York Blvd., Jamaica, Long Island, N. Y.
Dietzgen Co., Eugene, 2425 Sheffield Ave., Chicago 14, Ill.
Dillon & Co., Inc., W. C., 14620 Keswick St., Van Nuys, Calif.
Dillon Steam Boiler Wks., Inc., D. M., Crocker St., Fitchburg, Mass.
Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 46.
Division Lead Co., 7742 W. 61st Pl., Summit, Ill.
Dixon Crucible Co., Joseph, Wayne & Monmouth Sts., Jersey City 3, N. J.
DoAll Co., The, 254 N. Laurel Ave., Des Plaines, Ill.
Dockson Corp., 3839 Wabash Ave., Detroit 8, Mich.
Dockstader, Inc., S. E., 1127 Munsey Bldg., Washington 4, D. C.
Dodge Mfg Corp., 500 S. Union St., Mishawaka, Ind.
Doerr Electric Corp., 508 N. 4th St., Cedarburg, Wis.
Dole Refrigerating Co., 5910 N. Pulaski, Chicago 30, Ill.
Dole Valve Co., The, Morton Grove, Ill.
Dollinger Corp., 9 Centre Park, Rochester 3, N. Y.
Domestic Mfg. Corp., P. O. Box 252, Bellaire, Texas
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Donaldson Div., Marvin D. Shafer Co., Inc., 2915 Knox Ave., Los Angeles 39, Calif.
Dormeyer Industries, 3418 Milwaukee Ave., Chicago 41, Ill.
Dormont Mfg. Co., 5607 Butler St., Pittsburgh 1, Pa.
Dover Mfg. Co., Box 498, Independence, Mo.
Dow Chemical Co., The, Midland, Mich.
Dow Corning Corp., Midland, Mich.
Dowell, Inc., P. O. Box 536, Tulsa 1, Okla.
Downing Steel Products, 2305 Smithville Rd., Dayton 10, O.
Downingtown Iron Works, Inc., Div. of Pressed Steel Tank Co., Wallace Ave., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Foot of 23rd St., Brooklyn 32, N. Y.
Doyle Vacuum Cleaner Co., 225 Stevens St., S. W., Grand Rapids 2, Mich.
Drage Products, Inc., 406 32nd St., Union City, N. J.
Dravo Corp., Machinery Div., Dravo Bldg., Pittsburgh 22, Pa.
Drayer-Hanson, Division of National-U. S. Radiator Corp., Box 2215, Terminal Annex, Los Angeles 54, Calif.
Dreier Brothers Inc., 7301 Woodlawn Ave., Chicago 19, Ill.
Dreis & Krump Mfg. Co., 7404 Loomis Blvd., Chicago 36, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., 49 Fisher Ave., Bradford, Pa.
Drew & Co., Inc., E. F., 13 E. 26th St., New York, N. Y.
Drico Industrial Corp., 100 8th St., Passaic, N. J.
Driv-Way Lite Co., P. O. Box 2850, Denver, Colo.
Drying Systems, Inc., 1812½ W. Foster Ave., Chicago 40, Ill.
Dryomatic Corp., 806 N. Fairfax St., P. O. Box 334, Alexandria, Va.
Dual-Air Fan Co., P. O. Box 208, Hampshire, Ill.
Ducon Co., The, 147 E. 2nd St., Mineola, N. Y.
Dudgeon, Inc., Richard, 789 Bergen St., Brooklyn 38, N. Y.
Dunham-Bush, Inc., 179 South St., West Hartford 10, Conn.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Duo-Therm Div., Motor Wheel Corp., Lansing 3, Mich.
du Pont de Nemours & Co., E. I., Electrochemicals Dept., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Explosives Dept., Chemical Sales, Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Finishes Div., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington 98, Del.
du Pont de Nemours & Co., Inc., E. I., "Kinetic" Chemicals Div., 10th and Market Sts., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Photo Products Dept., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Polychemicals Dept., Wilmington 98, Del.
Durabla Mfg. Co., 114 Liberty St., New York 6, N. Y.
Duraloy Co., Scottdale, Pa.
Durant Insulated Pipe Co., Warren Way & Bay Rd., Palo Alto, Calif.
Durant Insulated Pipe Co., Inc., Williamstown, N. J.
Durez Plastics Div., Hooker Electrochemical Co., 1953 Walck Rd., North Tonawanda, N. Y.
Duriron Co., Inc., The, 450 N. Findlay St., Dayton 1, O.
Durkee-Atwood Co., 215 N. E. 7th St., Minneapolis, Minn.
Duro Co., The, 537 E. Monument Ave., Dayton 1, O.
Duro-Dyne Corp., 800 Third Ave., New Hyde Park, Long Island, N. Y.
Duro Metal Products Co., 2649 N. Kildare Ave, Chicago, Ill.
Dust Filter Co., 134 S. La Salle St., Chicago 3, Ill.
Dust Suppression & Engineering Co., P. O. Box 67, Lake Orion, Mich.
Dustex Corp., 1758 Walden Ave., Buffalo 25, N. Y.
Dutton Boiler Div., Hapman-Dutton Co., 623 Gibson St., Kalamazoo 6, Mich.
DuVerre, Inc., P. O. Box 97, Hamburg, N. Y.
Dwyer Mfg. Co., F. W., P. O. Box 373, Michigan City, Ind.
Dynamic Air Engineering, Inc., 7412 Maie Ave., Los Angeles 1, Calif.

E

Eagan Co., Inc., Walter H., 2336-38 Fairmount Ave., Philadelphia 30
Eagle Chemical Co., Inc., 20 W. Jackson Blvd., Chicago 4, Ill.
Eagle-Picher Co., American Bldg., Cincinnati 1, O.
Eastern Industries Inc., 100 Skiff St., Hamden 14, Conn.
Eastern Stainless Steel Corp., P. O. Box 1975, Baltimore 3, Md.
Eastman Kodak Co., 343 State St., Rochester 4, N. Y.
Easton Plastic Products Co., Inc., 900 Line St., Easton, Pa.
Easton R. S. Corp., 876 Pacific St., Brooklyn 38, N.Y.
Eaton Air Filter Co., 2609 E. Larned, Detroit, Mich.
Eaton Mfg. Co., Foundry Div., 700 E. Huron Ave., Vassar, Mich.
Ebco Mfg. Co., 265 N. Hamilton Rd., Columbus 13, O.
Ebert Electronics Corp., 212-26 Jamaica Ave., Queens Village 28, N. Y.
Eckhart Mfg. Co., Inc., 831 Lehigh Ave., Union, N. J.
Eclipse Fuel Engineering Co., 1139 Buchanan St., Rockford, Ill.
Eco Engineering Co., 12 New York Ave., Newark 1, N. J.
Econo Products Company Inc., Div. of Viking Instruments, Inc., East Haddam, Conn.
Economy Valve Seat Co., 1436 N. Keating, Chicago 51, Ill.
Eddington Metal Specialty Co., P. O. Box K, Eddington, Pa.
Eddy Valve Co., Waterford, N. Y.
Edison, Inc., Thomas A., Instrument Div., 60 Lakeside Ave., West Orange, N. J.
Eds-Wil Burner Corp., 2656 Diversey Ave., Chicago 47, Ill.
Edward Valves, Inc., 1200 W. 145th St., East Chicago, Ind.
Edwards, L. V., 32 Irving Place, Rockville Center, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Eisler Engineering Co., Inc., 750 S. 13th St., Newark 3, N. J.

Ejay Baseboard Mfg. Co., 124 Boyd St., Winsted, Conn.
Elastic Porcelain Lining Corp., 221 Norris Dr., Rochester 10, N. Y.
Elco Tool & Screw Corp., 1800 Broadway, Rockford, Ill.
Electric Arc, Inc., 152 Jelliff Ave., Newark 8, N. J.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo 1, O.
Electric Controller & Mfg. Co., Div. of Square D Co., 4526 Lee Rd., Cleveland 28, O.
Electric Furnace-Man, Inc., Emmaus, Pa.
Electric Hose & Rubber Co., Wilmington, Del.
Electric Machinery Mfg. Co., 800 Central Ave., Minneapolis 13, Minn.
Electric Motor Corp., Div. of Howard Industries, Inc., Racine, Wis.
Electric Motors & Specialties, Inc., King & Hamsher Sts., Garrett, Ind.
Electric Products Co., 1725 Clarkstone Rd., Cleveland, O.
Electric Steel Foundry Co., 2141 N. W. 25th St., Portland 10, Ore.
Electriglas Corp., Bergenfield, N. J.
Electro-Air Cleaner Co., 1285 Reedsdale St., Pittsburgh 33, Pa.
Electro Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Electrofilm, Inc., P. O. Box 106, North Hollywood, Calif.
Electro Mfg. Co., 2903 Whitney, Houston, Tex.
Electro Rust-Proofing Corp., 30 Main St., Belleville, N. J.
Electrol Burner Mfg. Co., Inc., 22 Union Ave., Rutherford, N. J.
Electromode Div. of Commercial Controls Corp., 45 Crouch St., Rochester 3, N. Y.
Electro-Switch & Controls Inc., 5755 Camille Ave., Culver City, Calif.
Electro-Therm, Inc., 931 Selim Rd., Silver Spring, Md.
Electrovent Fan & Mfg. Co., 812 W. Lake St., Chicago 7, Ill.
Elgen Mfg. Co., 41-34 39th St., Long Island City 4, N. Y.
Elgin Softener Corp., Elgin, Ill.
Elgo Shutter & Mfg. Co., 2738 W. Warren Ave., Detroit 8, Mich.
Elliott Co., Jeannette, Pa.
Ellis & Watts Products, Inc., P. O. Box 33, Cincinnati 36, O.
Ellison Draft Gage Co., 548 W. Monroe St., Chicago, Ill.
Elraco Engineering Co., 732 W. 58th St., Los Angeles, 37, Calif.
El-Tronics, Inc., 1420 Walnut St., Philadelphia 2, Pa.
Elvee Co., Box 237, Melrose 76, Mass.
Embassy Steel Products, Inc., 890 Stanley Ave., Brooklyn 8, N. Y.
Emco Pneumatic Corp., 1317 Locust St., Des Moines, Ia.
Emerson Electric Mfg. Co., The, 8100 Florissant Ave., St. Louis 21.
Emerson-Quiet Kool Corp., 46 Oliver St., Newark 5, N. J.
Emerson Radio and Phonograph Corp., 14th & Coles St., Jersey City, N. J.
Emjay Maintenance Engineers, 327 Union Ave., Rutherford, N. J.
Empire Chemical Products Co., 10 Longworth St., Newark 2, N. J.
Empire Ventilation Equipment Co., 35-39 Vernon Blvd., Long Island City, N. Y.
Enderle, Inc., Ltd., Frank X., 1715 San Fernando Rd., Los Angeles 65, Calif.
Engelhard, Inc., Charles, 850 Passaic Ave., East Newark, N. J.
Engesser & Co., William L., 9745 East Rush St., El Monte, Calif.
Engineer Co., 75 West St., New York 6, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., 18th & Florida Sts., San Francisco 10, Calif.
Equipment Engineering Co., 2853 Columbus Ave., Minneapolis, Minn.
Erdle Perforating Co., 171 York St., Rochester 11, N. Y.
Ergolyte Mfg. Co., 3627 Lawrence St., N., Philadelphia 40, Pa.
Erickson Specialty Co., 10 Cayuga St., P. O. Box 141, Cohoes, N. Y.
Erie Bolt & Nut Co., Erie, Pa.
Erie City Iron Wks., 1450 East Ave., Erie, Pa.
Erie Tool Wks., 735 W. 12th St., Erie, Pa.
Ernst Water Column & Gauge Co., Livingston, N. J.
Ero Mfg. Co., 714 W. Monroe St., Chicago 6, Ill.
Ervite Corp., 4000 W. Ridge Rd., Erie, Pa.
Ess Instrument Co., 96 S. Washington Ave., Bergenfield, N. J.
Essex Wire Corp., 1601 Wall Street, Ft. Wayne 6, Ind.
Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif.
Eutectic Welding Alloys Corp., 40-40 172 St., Flushing 58, N. Y.
Evans Corp., The George, River Drive at 37th St., Moline, Ill.
Evans Machine Co., Inc., 122 S. Calverton Rd., Baltimore, Md.
Eveready Briksaw Co., 1509 S. Michigan Blvd., Chicago 5, Ill.
Everite Pump & Mfg. Corp., W. Roseville Rd., Lancaster, Pa.
Everlasting Valve Co., 49 Fisk St., Jersey City 5, N. J.
Everwarm, Inc., 2925 N. Central Ave., Knoxville, Tenn.
Excelsior Leather Washer Mfg. Co., 720-730 Chestnut St., Rockford, Ill.
Excelsior Steel Furnace Co., The, 546 W. Washington Blvd., Chicago, Ill.
Excelsior Tool & Machine Co., 31st & Ridge Ave., East St. Louis, Ill.
Extruded Plastics, Inc., New Canaan Ave., Norwalk, Conn.

F

Faber Engineering Co., Inc., Amber & Westmoreland Sts., Philadelphia 34, Pa.
Fabri-Valve Co. of America, 2100 N. Albina, Portland, Ore.
Fafnir Bearing Co., The, 37 Booth St., New Britain, Conn.
Fageol Co., R.D., Heat Machine Div., P. O. Box 328, Kent, O.
Fairbanks Co., The, 393 Lafayette St., New York 3, N. Y.
Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
Fairmont Aluminum Co., Fairmont, W. Va.
Fairmont Tool & Forging, Inc., 10611 Quincy Ave., Cleveland 6, O.
Falcon Equipment Co., 13th St., New Brighton, Pa.
Falk Corp., 3010 W. Canal St., Milwaukee 1, Wis.
Falstrom Co., 26 Falstrom Court, Passaic, N. J.
Famco Machine Co., 3114 Sheridan Rd., Kenosha, Wis.
Fanner Mfg. Co., The, Brookside Park, Cleveland 9, O.
Farr Company, P. O. Box 45187 Airport Station, Los Angeles 45, Calif.
Farrar & Trefts Div., ADSCO Industries, Inc., 20 Milburn St., Buffalo 12, N. Y.
Farrell Associates, Charles, Valencia, Pa.
Farris Engineering Corp., 400 Commercial Ave., Palisades Park, N. J.
Farris Flexible Valve Corp., Palisades Park, N. J.
Fasco Industries, Inc., P. O. Box 509, Rochester 2, N. Y.
Fedders-Quigan Corp., 57 Tonawanda St., Buffalo 7, N. Y.
Fedders-Quigan Corp., Heating Div., P. O. Box 1690, Trenton 7, N. J.
Federal Boiler Co., Inc., Granite and West Sts., Midland Park, N. J.
Federal-Mogul Div., Federal-Mogul-Bower Bearings, Inc., 11031 Shoemaker St., Detroit 13, Mich.
Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Felt Products Mfg. Co., 1504 Carroll Ave., Chicago 7, Ill.
Felters Company, The, 210 South St., Boston 11, Mass.
Fennelly Co., J. C., 1485 Bayshore Blvd., San Francisco, Calif.
Fenwal Inc., 130 Pleasant St., Ashland, Mass.
Fenway Machine Co., 263 N. 23rd St., Philadelphia, Pa.
Ferguson & Lange Foundry Co., 1039 Willow St., Chicago, Ill.
Fern, Ralph, 1007 Fisk St., Scranton 9, Pa.
Ferro Corp., 4150 East 56th St., Cleveland 5, O.
Ferro Electric Products, Inc., Kirkland, Ill.
Fibercast Corp., 100 S. Lincoln, Sand Spring, Okla.
Fibreboard Paper Products Corp., 475 Brannan St., San Francisco 10, Calif.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. 4th St., Philadelphia 33, Pa.
Filt-R-Ite Co., 1408 W. Harrison St., Chicago 7, Ill.
Filtrine Mfg. Co., Inc., 63 Wanamaker Ave., Waldwick, N. J.
Fine Products Co., 6240 Ogden, Berwyn, Ill.
Finn & Company, Inc., T. R., 200 Central Ave., Hawthorne, N. J.
Finnigan & Co., Inc., J. J., 722 Marietta, N. W., Atlanta, Ga.
Fischer & Porter Co., 6000 Warminster Rd., Hatboro, Pa.
Fisher Governor Co., 205 S. First Ave., Marshalltown, Ia.
Fisher Research Laboratory, Inc., 1961 University Ave., Palo Alto, Calif.
Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York 17, N. Y.
Flagg & Co., Inc., Stanley G., #3 Penn Center Plaza, Philadelphia 2, Pa.
Flanders Mill, Inc., Riverhead, Long Island, N. Y.
Flemm Lead Co., Inc., Bradley Ave., & School St., Long Island City, 1, N. Y.
Flexaust Co., 100 Park Ave., New York 17, N. Y.
Flexible Metal Hose Mfg. Co., 777 West 16th St., Costa Mesa, Calif.
Flexible Tubing Corp., Guilford, Conn.
Flexitallic Gasket Co., 918 N. 8th St., Camden 2, N. J.
Flexlock Corp., Box 178, Kent, O.
Flexo Supply Co., Inc., 4649 Page Blvd., St. Louis 13, Mo.
Flexonics Corp., 1391 S. Third Ave., Maywood, Ill.
Flexrock Co., 36 & Filbert Sts., Philadelphia 4, Pa.
Flintkote Co., The, 30 Rockefeller Plaza, New York 20, N. Y.
Flodar Corp., 16911 St. Clair, Cleveland 10, O.
Flood Co., Hudson, O.
Flori Pipe Co., The, 5700 Bulwer, St. Louis 15, Mo.
Floridin Co., P. O. Box 989, Tallahassee, Fla.
Flow Corp., 283 Concord Ave., Cambridge 38, Mass.
Fluid Heat Div., Anchor Post Products, Inc., 6500 Eastern Ave., Baltimore 24, Md.
Fluid Systems, Inc., 1881 Dixwell Ave., New Haven 14, Conn.
Fluidwick Co., 5319 E. Outer Drive, Detroit 34, Mich.
Fluor Products Co., A Div. of the Fluor Corp., Ltd., Air Conditioning & Refrigeration Cooling Tower Div., 12000 E. Washington Blvd., Whittier, Calif.
Fluxolder Products Co., 438 E. Woodbridge St., Detroit 26, Mich.
Flynn & Emrich Co., 301 Holliday St., Baltimore 2, Md.
Formica Corp., The, 4614 Spring Ave., Cincinnati, O.
Forney Engineering Co., 2705 Hawes St., Dallas 9, Tex.
Ft. Worth Steel & Machinery Co., P. O. Box 1038, Ft. Worth, Tex.
Forty-Eight Insulations, Inc., P. O. Box 472, Aurora, Ill.
Foster Co., Benjamin, 4635 W. Girard Ave., Philadelphia 31, Pa.
Foster Engineering Co., 835 Lehigh St., Union, N. J.
Foster Pump Wks., Inc., 46-A Washington St., Brooklyn 1, N. Y.
Foster Wheeler Corp., 165 Broadway, New York 6, N. Y.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Foxboro Co., 106 Neponset Ave., Foxboro, Mass.
Fram Corp., Providence 16, R. I.
France Refractories Co., J. H., 1921 France Rd., Snow Shoe, Pa.
Franklin Balmar Corp., Woodberry, Baltimore 11, Md.
Franklin Dales Co., 180-184 E. Mill St., Akron, O.
Franklin Electric Co., Inc., 400 E. Spring St., Bluffton, Ind.
Franklin Plastics, Inc., Franklin, Pa.
Frederick Iron & Steel Inc., E. 7th St., Frederick, Md.
Freeman Heating Div., Illinois Iron & Bolt Co., Carpentersville, Ill.
Fresh'nd-Aire Co., Div. of Cory Corp., 3200 W. Peterson, Chicago, Ill.
Fretz-Moon Tube Co., Inc., P. O. Box 551, Butler, Pa.
Frick Co., Waynesboro, Pa.
Fricke, Fred J., 4404 Avenida Estrellita, Albuquerque, N. M.
Friedrich Refrigerators, Inc., 1117 E. Commerce, San Antonio, Tex.
Friermood Machine Works, Converse, Ind.
Friez Instrument Div., Bendix Aviation Corp., Taylor Ave., Towson, Baltimore 4, Md.
Frigid, Inc., 128 32nd St., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton 1, O.
Frigikar Corp., 1602 Cochran, Dallas, Tex.
Frontier Bronze Corp., Packard Rd., Niagara Falls, N. Y.
Fuelguard Co., 5643 Dyer St., Dallas 6, Tex.
Fuel Reduction Corp., 220 N. Ada St., Chicago 7, Ill.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Fuller Co., 124 Bridge St., Catasauqua, Pa.
Fuller Co., D. William, 2320 E. 75th St., Chicago 49, Ill.
Fuller Co. of Calif., H. B., 1060 Howard, San Francisco, Calif.

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Box 400, Knoxville 1, Tenn.
Furnas Electric Co., 1041 McKee St., Batavia, Ill.

G

G & H Mfg. Co., 3047 Amber St., Philadelphia 34, Pa.
G. M. Mfg. Co., 50 W. 3rd St., New York 12, N. Y.
G & O Mfg. Co., 138 Winchester Ave., New Haven 8, Conn.
Gabriel Boiler Co., 1428 N.W. 14th Ave., Portland, Ore.
Gallaher Co., The, 4108 Dodge St., Omaha 3, Neb.
Gannon Co., Inc., Russell R., The, 5535 Vine St., Cincinnati, O.
Garden City Fan Co., 332 S. Michigan Ave., Chicago 4, Ill.
Garden City Instruments, Inc., 608 S. Dearborn St., Chicago 5, Ill.
Gardiner Metal Co., 2514 W. 48th Pl., Chicago 32, Ill.
Gardner-Denver Co., Quincy, Ill.
Garlock Packing Co., The, 402 Main St., Palmyra, N. Y.
Garman Co., Inc., The, 1253 Grover Rd., St. Louis 23, Mo.
Gas Machinery Co., 16100 Waterloo Rd., Cleveland 10, O.
Gas & Oil Industry Laboratories, Inc., 4 Paine Ave., Irvington, N. J.
Gasoilair Equipment Co., P. O. Box 768, New Haven, Conn.
Gates Engineering Co., 100 S. West St., Wilmington 99, Del.
Gates Rubber Co., The, 999 S. Broadway, Denver 17, Colo.
Gateway Engineering Co., 3233 W. Grand Ave., Chicago, Ill.
Gatke Corp., 228 N. LaSalle St., Chicago 1, Ill.
Gato Valve Co., 912-916 Behan St., Pittsburgh 33, Pa.
Gavitt Wire & Cable Co., Div. of American Hard Rubber Co., 100 Central St., Brookfield, Mass.
Gehri Co., 1117 Tacoma Ave., Tacoma 3, Wash.
Gel-Me Co., P. O. Box 293, Bloomington, Ill.
Gen-A-Matic Corp., 14741 Bessemer St., Van Nuys, Calif.
General Air Conditioning Corp., 4542 E. Dunham St., Los Angeles, Calif.
General Automatic Products Corp., 2300 Sinclair Lane, Baltimore 13, Md.
General Blower Co., 8610 Ferris Ave., Morton Grove, Ill.
General Ceramics Corp., Crows Mill Road, Keasbey, N. J.
General Chemical Div., Allied Chemical & Dye Corp., 40 Rector St., New York, N. Y.
General Controls Co., 801 Allen Ave., Glendale 1, Calif. and Skokie, Ill.
General Electric Co., Air Conditioning Div., 5 Lawrence St., Bloomfield, N. J.
General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, N. Y.
General Electric Co., Appliance & Television Receiver Div., Appliance Park, Louisville 1, Ky.
General Electric Co., Capacitor Dept., Hudson Falls, N. Y.
General Electric Co., Chemical and Metallurgical Div., 1 Plastics Ave., Pittsfield, Mass.
General Electric Co., Commercial & Industrial Air Conditioning Dept., 5 Lawrence St., Bloomfield, N. J.
General Electric Co., Construction Materials Div., 1285 Boston Ave., Bridgeport 2, Conn.
General Electric Co., Large Lamp Dept., Nela Park, Cleveland 12, O.
General Filter Co., 923 Second St., Ames, Ia.
General Filters, Inc., 43800 Grand River, Novi, Mich.
General Fittings Co., P. O. Box 151, East Greenwich, R. I.
General Gas Light Co., 202 N. Park, Kalamazoo 11F, Mich.
General Heating Products Co., 7426 State Rd., Philadelphia 36, Pa.
General Paint Corp., 2627 Army St., P. O. Box 3474, San Francisco.
General Plate Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
General Register Corp., 14 Factory St., Cedar Grove, N. J.
General Scientific Equipment Co., P. O. Box 3038, Philadelphia 50, Pa.
General Tire & Rubber Co., 444 Tacoma Ave., Logansport, Ind.
General Tire & Rubber Co., 1708 Englewood, Akron, O.
General Tire & Rubber Co., Industrial Products Div., Wabash, Ind.
Geneva Mfg. Co., N. Woodbury Rd., South Elgin, Ill.
Genie-Air, 4273 S. Broadway, Los Angeles, Calif.
Gerett Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Germatrol Corp., 622 Brookline Blvd., Pittsburgh 26, Pa.
Gerrard & Co., A. J., 1950 Hawthorne Ave., Melrose Park, Ill.
Gerry Tool Co., The, 135 Terryville Rd., Bristol, Conn.
Gerstein & Cooper, Inc., 1 W. 3rd St., South Boston, Mass.
Gerwin Industries, Inc., 214 Spring St., Michigan City, Ind.
Giannini & Co., Inc., G. M., 918 E. Green St., Pasadena, Calif.
Giant Mfg. Co., 6th St. & 12th Ave., Council Bluffs, Ia.
Gibson Industries, Inc., 3590 Airline Rd., Muskegon, Mich.
Gibson Refrigerator Co., Greenville, Mich.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilbert Brass Foundry Co., 5028 Farlin St., St. Louis, Mo.
Gilbreth Co., The, 1211 Chestnut St., Philadelphia 7, Pa.
Gisholt Machine Co., 1253 E. Washington Ave., Madison 10, Wis.
Glidden Co., The, 11001 Madison Ave., Cleveland 2, O.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Globe Products, Huppower Div., Hupp Corp., 7450 Melville Ave., Detroit 17, Mich.
Glycolator Sales & Service, P. O. Box 5814, Pittsburgh 9, Pa.
Goder Incinerator Corp., 407 S. Dearborn St., Chicago 5, Ill.
Goethel Sheet Metal Wks., Inc., Alfred, 3218 W. Fond du Lac Ave., Milwaukee 10, Wis.
Golden Anderson Valve Specialty Co., 1232 Ridge Ave., Pittsburgh 33.
Goldens' Foundry & Machine Co., Columbus, Ga.
Goodall Rubber Co., 441 Whitehead Rd., Trenton, N. J.
Goodfellow Co., Inc., E. D., 496 E. Bodley Ave., Memphis, Tenn.
Goodrich Co., B. F., 548 S. Main St., Akron 18, O.
Goodrich Chemical Co., B. F., 3135 Euclid Ave., Cleveland 15, O.
Goodrich Industrial Products Co., B. F., Akron, O.
Goodrich Industrial Products Co., B. F., Plastics Products, Marietta, O.
Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, O.
Goodwill Mfg. Co., 1213 S. Laramie, Chicago 50, Ill.
Gordon & Piatt, Inc., P. O. Box 914, Winfield, Kan.
Gorman-Rupp Industries, Inc., Belleville, O.
Gorton Heating Corp., Cranford, N. J.
Goss Gas Inc., 5209 Baum Blvd., Pittsburgh 24, Pa.
Gould Co., J. D., 4707 Massachusetts Ave., Indianapolis 18, Ind.
Goulds Pumps, Inc., Fall St., Seneca Falls, N. Y.
Governair Corp., 513 N. Blackwelder St., Oklahoma City 4, Okla.
Grabler Mfg. Co., 6565 Broadway, Cleveland 5, O.
Graham Mfg. Co., Inc., 415 Lexington Ave., New York 17, N. Y.
Graham Mfg. Corp., 31465 Stephenson Highway, Royal Oak 4, Mich.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Granberg Corp., 1308 67th St., Oakland 8, Calif.
Granite City Steel Co., 20th & Madison Ave., Granite City, Ill.
Grant Wilson, Inc., 141 W. Jackson Blvd., Suite 1560, Chicago, Ill.
Graphic Calculator Co., 633 Plymouth Ct., Chicago 5, Ill.
Graphic Indicator Co., 1739 S. La Cienega Blvd., Los Angeles 35, Calif.
Graton & Knight Co., Inc., 356 Franklin St., Worcester 4, Mass.
Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.
Gray Co., Inc., 56 - 11th Ave., N. E., Minneapolis 13, Minn.
Gray Metal Products, Inc., 30 Carleton St., Rochester, N. Y.
Gray Tool Co., P. O. Box 2291, Houston, Tex.
Great Northern Mfg. Corp., 1056 N. Wood St., Chicago 22, Ill.
Great Western Steel Co., 2300 West 58th, Chicago, Ill.
Green Fire Brick Co., A. P., Mexico, Mo.
Green Fuel Economizer Co., 780 Main St., Beacon, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Greenfield Tap & Die Corp., Sanderson St., Greenfield, Mass.
Greenheck Bros. Mfg. Co., Schofield, Wis.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., 2136 12th St., Rockford, Ill.
Greenwood Valve Div. of Vernon Tool Co., Ltd., 1101 Meridian Ave., Alhambra, Calif.
Greer Hydraulics, Inc., International Airport, Jamaica 30, N. Y.
Griffin & Co., 500 Bergman Ave., Louisville 8, Ky.
Griffith Equipment Co., Inc., 4503 Alger St., Los Angeles 39, Calif.
Grinnell Co., Inc., 260 W. Exchange St., Providence 1, R. I.
Grip Nut Co., South Whitley, Ind.
Griscom-Russell Co., The, Massillon, O.
Gross-Aire Mfg. Co., 9416 W. Milton Ave., Overland 14, Mo.
Grove Valve and Regulator Co., 65th & Hollis St., Oakland, Calif.
Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 12, Ill.
Guardian Products Corp., 1215 E. 2nd St., Michigan City, Ind.
Gulf Oil Corp., P. O. Box 1166, Gulf Bldg., Pittsburgh 30, Pa.
Gustin-Bacon Mfg. Co., 210 W. 10th St., Kansas City 6, Mo.

H

H. A. Mfg. Co., 1612 W. King St., York, Pa.
H-B Instrument Co., American & Bristol Sts., Philadelphia 40, Pa.
H & H Tube & Mfg. Co., 245-275 N. Forman Ave., Detroit 17, Mich.
H & M Pipe Beveling Machine Co., 311 East 3rd, Tulsa, Okla.
H-P Products, Inc., Louisville, O.
Hadley Products Co., Marietta, O.
Haertel Co., Walter, 2840 4th Ave., S., Minneapolis, Minn.
Hagan Corp., Hagan Bldg., Pittsburgh 30, Pa.
Hager Bros., East P. O. Box 1511, Rockford, Ill.
Hague & Co., Inc., Alfred, 230 Thirty-fourth St., Brooklyn 32, N. Y.
Haines Div., Wm. S., Sellers Injector Corp., 1600 Hamilton St., Philadelphia 30, Pa.
Hall Laboratories, Inc., 323 Fourth Ave., Pittsburgh 30, Pa.
Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.
Hamburg Boiler Wks., Inc., Grand St., Hamburg, Pa.
Hamer Valves, Inc., 2919 Gardenia Ave., Long Beach 6, Calif.
Hamilton Div., Baldwin-Lima-Hamilton Corp., Hamilton, O.
Hamilton Rubber Mfg. Corp., Box 361, Trenton 3, N. J.
Hamlin Co., Inc., J. F., 746 Ellis St., San Francisco 9, Calif.
Hammel-Dahl Co., 175 Post Rd., (Warwick), Providence 5, R. I.
Hammett Electric Mfg. Co., 209 W. 19th Terrace, Kansas City 8, Mo.
Hammond Brass Wks., 1844 Summer Blvd., Hammond, Ind.
Hampton-Cross Co., The, 120 S. 10th St., Louisville 2, Ky.
Handy & Harman, 82 Fulton St., New York 38, N. Y.
Haney Gas Burner & Engineers, Inc., 909 So. Myrtle Ave., P. O. Box 147, Monrovia, Calif.
Hanna Engineering Wks., 1765 N. Elston, Chicago 22, Ill.
Hannifin Corp., 501 S. Wolf, DesPlaines, Ill.
Hanovia Chemical & Mfg. Co., 100 Chestnut St., Newark 5, N. J.
Hansen Mfg. Co., Inc., Princeton 6, Ind.
Hansen Mfg. Co., 4031 West 150th St., Cleveland, O.
Hanson-Gates Mfg. Co., Inc., 8 Prescott St., Reading, Mass.
Harco Corp., 16901 Broadway, Bedford, O.
Hardinge Oil Burner & Mfg. Co., 1770 Berteau St., Chicago 13, Ill.
Harmond Company, 2114 Woodlawn, Cleveland 2, O.
Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis.
Harold Electric Co., 210 E. Alder, Walla Walla, Wash.
Harper Co., H. M., Morton Grove, Ill.
Harrington & King Perforating Co., Inc., 5655 Fillmore St., Chicago 44, Ill.
Harris Calorific Co., The, 5501 Cass Ave., N. W., Cleveland 2, O.
Harris & Co., Arthur, 210 N. Aberdeen St., Chicago 7, Ill.
Harrisburg Steel Corp., 10th & Herr Sts., Harrisburg, Pa.
Harrison Radiator Div., General Motors, Lockport, N. Y.
Harrison Sheet Steel Co., 4718 W. 5th St., Chicago 44, Ill.
Harry Cooling Towers, Inc., 125 Cedar St., New York 6, N. Y.
Hart & Cooley Mfg. Co., Holland, Mich.
Hart Mfg. Co., The, 116 Bartholomew Ave., Hartford 1, Conn.
Hartmann Co., Chas., 985 Dean St., Brooklyn 38, N. Y.

Hartwell & Son, Inc., H. N., Park Square Bldg., Boston, Mass.
Hartzell Propeller Fan Co., P. O. Box 909, Roosevelt Ave., Piqua, O.
Harvey Aluminum, 19200 S. Western Ave., Torrance, Calif.
Harv-O-Metic Co., 3445 Cahuenga Blvd., Los Angeles 28, Calif.
Hasco Valve & Machine Co., 1263 N. 70th St., Milwaukee 13, Wis.
Haskel Engineering & Supply Co., 1236 S. Central Ave., Glendale, Calif.
Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.
Hastings Air Control, Inc., 3215 Leavenworth St., Omaha, Nebr.
Hastings-Raydist, Inc., Hampton, Va.
Hauck Mfg. Co., 126-136 10th St., Brooklyn 15, N. Y.
Haveg Industries, Inc., 900 Greenbank Rd., Newark, Del.
Havens Structural Steel Co., Cooling Tower Div., 1713 Crystal Ave., Kansas City, Mo.
Haydon Co., A. W., The, 232 N. Elm, Waterbury, Conn.
Haydon Mfg. Co., Inc., Sub. General Time Corp., Torrington, Conn.
Hayes Furnace Mfg. & Supply Co., 3233 South LaCienega Blvd., Los Angeles 16, Calif.
Hays Corp., The, 800 E. 8th St., Michigan City 14, Ind.
Hays Mfg. Co., 801 W. 12th St., Erie, Pa.
Haywood Industries, Racine, Wis.
Healey Co., Lee, 554 W. Garfield, Glendale 4, Calif.
Healy Ruff Co., 2257 University Ave., St. Paul 4, Minn.
Heat-Exchangers, Inc., 2003 W. Fulton St., Chicago, Ill.
Heat & Power Corp., 424 E. Saratoga St., Baltimore 2, Md.
Heat-Timer Corp., 657 Broadway, New York 12, N. Y.
Heat Transmission Conduit Co., 2300 Payne Ave., Rm. 503, Cleveland 14, O.
Heatron, Inc., 333 Eberts Lane, York, Pa.
Heatube Corp., Allegan, Mich.
Heat-X, Inc., Brewster, N. Y.
Heating Assurance, Inc., 124 E. Augusta St., Spokane 13, Wash.
Heating Equipment Co., 19635 Schoolcraft, Detroit 23, Mich.
Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland, O.
Heinemann Electric Co., 497 Plum St., Trenton 2, N. J.
Helical Tube Corp., 1825 Monroe Ave., N. W., Grand Rapids, Mich.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport 2, Conn.
Heller Laboratories, Inc., 124 Fort Lee Rd., Leonia, N. J.
Helmco, Inc., 7400 W. Lawrence Ave., Chicago 31, Ill.
Hendley & Whittemore, 6 Blackhawk Blvd., Beloit, Wis.
Hendrick Mfg. Co., 37 Dundaff St., Carbondale, Pa.
Henry Furnace Co., The, Medina, O.
Henry Valve Co., 3215 North Ave., Melrose Park, Ill.
Henszey Co., 202½ N. Water St., Watertown, Wis.
Herbusch Corp., The, 706 Chestnut St., 210 Title Guaranty Bldg., St. Louis 1, Mo.
Hercules Chemical Co., Inc., 416 Broadway, New York 13, N. Y.
Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7.
Heresite & Chemical Co., Manitowoc, Wis.
Hermidifier Co., P. O. Box 145, Neffsville, Pa.
Hermon Hosmer Scott, Inc., 385 Putnam Ave., Cambridge 39, Mass.
Hersey Mfg. Co., Cor. E and 2nd Sts., South Boston 27, Mass.
Hershey Motorstokor, Inc., Manheim, Pa.
Hertner Electric Co., The, 12690 Elmwood Ave., Cleveland 11, O.
Hewitt-Robins Inc., 666 Glenbrook Rd., Stamford, Conn.
Hexdall Co., A. M., Morris, Ill.
Hi-Flow Products, Inc., 1395 Marconi Blvd., Copiague, N. Y.
Hi-Grade Alloy Corp , 1236 S. Talman, Chicago 8, Ill.
Hill Co., Francis, 5403 Prospect Ave., Cleveland 3, O.
Hill & Co., E. Vernon, P. O. Box 189, Lake Geneva, Wis.
Hill, Hubbell & Co., 3091 Mayfield Rd., Cleveland 18, O.
Hill, Inc., Walter P., 22183 Telegraph Rd., Detroit 19, Mich.
Hilliard Corp., 100 W. 4th St., Elmira, N. Y.
Hills-McCanna Co., 3023 N. Western Ave., Chicago 18, Ill.
Hilo Varnish Corp., Div. of Carpenter-Morton Co., 376 Third St., Everett 49, Mass.
Hilti Rapid Fastening Systems, Inc., 55 Vandam St., New York 13, N. Y.
Hinde & Dauch Paper Co., P. O. Box 861, Sandusky, O.
Hirschman-Pohle Co., Inc., 12 Lent Ave., LeRoy, N. Y.
Hite Mfg. Co., N. E., 303 North Elizabeth St., Chicago 7, Ill.
Hobart Bros. Co., Troy 1, O.
Hobsite Products Co., 308 Sussex St., Harrison, N. J.
Hodge Boiler Wks., 99-111 Sumner St., East Boston 28, Mass.
Hodgman Mfg. Co., Inc., 135 Washington St., Taunton, Mass.
Hoff Mfg. Co., Johnson Rd., Bethany, New Haven 15, Conn.
Hoffberger Co., C., Monument and Forrest, Baltimore 2, Md.
Hoffman Combustion Engrg. Co., 1780 Southfield Rd., Lincoln Park, Mich.
Hoffman Specialty Mfg. Corp., 1700 W. 10th St., Indianapolis 7, Ind.
Hogart Engineering Co., 1050 S. Oliver St., Los Angeles, Calif.
Holby Tempering Valve Co., 1146 Second Ave., New York 21, N. Y.
Holden Co., A. F., 14341 Schaefer Highway, Detroit 27, Mich.
Hollands Mfg. Co., Erie, Pa.
Holsclaw Bros., Inc., 408 N. Willow Rd., Evansville 11, Ind.
Holtzer-Cabot Electric Motor Div., National Pneumatic Co., Inc., 125 Armory St., Boston 19, Mass.
Holub Industries, Inc., Sycamore, Ill.
Homestead Valve Mfg. Co., P. O. Box 348, Coraopolis, Pa.
Hoppes Mfg. Co., Inc., 301 N. Greenmount Ave., Springfield, O.
Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City, N. Y.
Horton Mfg. Co., 1179 15th Ave., Minneapolis 14, Minn.
Hossfeld Mfg. Co., 460 W. Third St., Winona, Minn.
Hotpoint Co., 5600 W. Taylor St., Chicago 44, Ill.
Hotstream Heater Co., 2363 E. 69th St., Cleveland 4, O.
Houghton & Co., E. F., 303 W. Lehigh Ave., Philadelphia 33, Pa.
Howard Industries, Inc., Racine, Wis.
Howe Ice Machine Co., 2825 Montrose Ave., Chicago 18, Ill.
Howell Electric Motors Co., Howell, Mich.
Howes-Woods Co., 201 Bridge St., Cambridge, Mass.
Hubbell Corp., P. O. Box 700, Hawley Rd., Mundelein, Ill.
Huck Mfg. Co., 2480 Bellvue, Detroit, Mich.
Hudson Industries, Inc., 4400 St. Aubin Ave., Detroit 7, Mich.
Humboldt Mfg. Co., 2016 N. Whipple St., Chicago, Ill.
Hungerford & Terry, Inc., Clayton, N. J.
Hunt & Son, Inc., C. B., Salem, O.
Hunt Spiller Mfg. Corp., 383 Dorchester Ave., Boston, Mass.
Hunter Div., Robbins & Myers, Inc., 2500 Frisco Ave., Memphis, Tenn.
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa.
Huron Boiler Co., 10457 Gratiot Ave., Detroit 13, Mich.
Hussey & Co., C. G., Div. of Copper Range Co., 2850 Second Ave., Pittsburgh 19, Pa.
Huyette Co., Inc., Paul B., 401 N. Broad St., Philadelphia 8, Pa.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Hydraulic Mfg. Co., 616 West Taft Ave., Bridgeport 4, Conn.
Hydrotherm, Inc., Clinton Ave., Northvale, N. J.
Hydrozion Engineering Co., Inc., 2003 Indiana Ave., Kansas City 27, Mo.
Hynes Electric Heating Div., Turbine Equipment Co., P. O. Box 578, Westfield, N. J.

I

Ideal Corp., 435 Liberty Ave., Brooklyn 7, N. Y.
Ideal Electric & Mfg. Co., E. First & Oak Sts., Mansfield, O.
Ideal Industries, Inc., 1096 Parke Ave., Sycamore, Ill.
Ilg Electric Ventilating Co., 2841 N. Crawford Ave., Chicago 41, Ill.
Illinois Bronze Powder Co., 2015 S. Clark St., Chicago 16, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., 2035 S. Racine Ave., Chicago 8, Ill.
Illinois Malleable Iron Co., 1701 Wellington, Chicago 13, Ill.
Illinois Oil Products, Inc., 4th Ave. and 24th St., Rock Island, Ill.
Illinois Testing Laboratories, Inc., 420 N. La Salle St., Chicago 10.
Illinois Water Treatment Co., 840 Cedar St., Rockford, Ill.
Illinois Zinc Co., Div. of Hydrometals, Inc., 2959 W. 47th St., Chicago 32, Ill.
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.
Imperial Damper Co., 664 Edgecombe Ave., New York 32, N. Y.
Imperial Electric Co., 64 Ira Ave., Akron, O.
Incinerator Products, Inc., 633 S. Post Ave., Detroit, Mich.
Independent Blade Corp., P. O. Box 1482, Joliet, Ill.
Independent Register Co., 3747 E. 93rd St., Cleveland 5, O.
Industrial Acoustics Co., Inc., 341 Jackson Ave., New York 54, N. Y.
Industrial Development Laboratories, Inc., 17 Pollock Ave., Jersey City 5, N. J.
Industrial Engineering & Equipment Co., 24 Hanley Industrial Ct., St. Louis (Brentwood), Mo.
Industrial Filter & Pump Co., 5900 W. Ogden Ave., Chicago 50, Ill.
Industrial Laminates Div., Fabric Distributing Co., 54 Franklin St., New York 13, N. Y.
Industrial Mfg. & Engineering Co., 3033 W. Belmont Ave., Chicago 18, Ill.
Industrial Metal Protectives, Inc., 401 Homestead Ave., Dayton 8, O.
Industrial Plastic Fabricators, Endicott St., Norwood, Mass.
Industrial Plastics Fittings Co., 3891 W. 150th St., Cleveland, O.
Industrial Products Co., 2666 N. Fourth St., Philadelphia 33, Pa.
Industrial Screw Co., 4920 W. Madison, Chicago 44, Ill.
Industrial Service Laboratories, 710 W. National Ave., Milwaukee 4.
Industrial Sound Control, Dept. of Koppers Co., Inc., Metal Products Div., 200 Scott St., Baltimore 3, Md.
Infra Insulation, Inc., 525 Broadway, New York, N. Y.
Ingersoll Conditioned Air Div., Borg-Warner Corp., 760 E. Vine St., Kalamazoo, Mich.
Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.
Ingersoll Steel Div., Borg-Warner Corp., 310 S. Michigan Ave., Chicago 4, Ill.
Inland Heater Corp., 3402 University S.E., Minneapolis, Minn.
Inland Steel Co., 38 S. Dearborn St., Chicago 3, Ill.
Inland Steel Products Co., 4029 W. Burnham St., Milwaukee 1, Wis.
Inner-Tite Div. of Yara Engineering Corp., 18 W. Jersey St., Elizabeth 4, N. J.
Insto-Gas Corp., 998 E. Woodbridge St., Detroit 7, Mich.
Instrument Cases, Inc., 510 Garfield St., Glendale 4, Calif.
Instruments, Inc., P. O. Box 556, Tulsa, Okla.
Insulite Div. Minnesota and Ontario Paper Co., 500 Investors Bldg., Minneapolis 2, Minn.
Insul-Lyte Corp., A Div. of Plibrico Co., 130 W. Pleasant, River Rouge 18, Mich.
Insul-Mastic Corp. of America, 7750 W. 61st Place, Summit, Ill.
Integral Corp., 100 Frank Road, Hicksville, Long Island, N. Y.
Inter-Coastal Paint Corp., 13th St. and Southern R. R., East St. Louis Ill.
Interchemical Corp., Finishes Div., 224 McWhorter St., Newark 1.
International Boiler Works Co., The, 5 Birch St., East Stroudsburg, Pa.
International Business Machines Corp., 590 Madison Ave., New York 22, N. Y.
International Covers for Air Conditioners Corp., 532 Broadway, New York, N. Y.
International Engineering, Inc., 1145 Bolander Ave., Dayton 1, O.
International Forge Co., 2308 S. Kedzie, Chicago, Ill.
International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.
International Heater Co., 101 Park Ave., Utica 2, N. Y.
International Mfg. Co., 600 E. Grand Ave., Oklahoma City, Okla.
International Metal Hose Co., Ashford Ave., Bellevue, O.
International Metal Products Co., P. O. Box 1712, Phoenix, Ariz.
International Nickel Co., Inc., The, 67 Wall St., New York 5, N. Y.
International Powder Metallurgy Inc., Ridgway, Pa.
International Register Co., 2620 W. Washington Blvd., Chicago 12, Ill.

International Steel Co., 1545 Edgar St., Evansville, Ind.
International Vermiculite Co., Girard, Ill.
Interstate Heater Mfg. Co., 2627 West 6th Ave., Denver, Colo.
Iona Ventilator Co., Inc., 2821-29 W. Dauphin St., Philadelphia 32.
Ionaire, Inc., 390 First St., San Francisco 5, Calif.
Iron Fireman Mfg. Co., 3170 W. 106 St., Cleveland 11, O.
Iron Lung Ventilator Co., 5403 Prospect Ave., Cleveland 3, O.
Irvington Varnish and Insulator, Div. of Minnesota Mining & Mfg. Co., 6 Argyle Terrace, Irvington 11, N. J.
Iwan Brothers, Inc., 1503 Prairie Ave., South Bend 14, Ind.

J

Jabsco Pump Co., 2031 Lincoln St., Burbank, Calif.
Jack & Heintz, Inc., 17600 Broadway, Cleveland 1, O.
Jackes-Evans Mfg. Co., Controls Div., 4427 Geraldine Ave., St. Louis 15, Mo.
Jackson & Church Co., 321 N. Hamilton Ave., Saginaw 65, Mich.
Jaco Devices Co., 100 High St., Hingham, Mass.
Jaco Manufacturing Co., 9231 Clinton Ave., Cleveland 9, O.
Jacuzzi Bros., Inc., 5327 Jacuzzi Ave., Richmond, Calif.
Jamieson Mfg. Co., 517 Bedford St., Dallas 12, Tex.
Jan-Air, Inc., Richmond, Ill.
Janette Elect. Mfg. Co., Lehigh at Main, Morton Grove, Ill.
Janitrol Heating & Air Conditioning Div., Surface Combustion Corp., 400 Dublin Ave., Columbus, O.
Jarrow Products, 420 N. LaSalle, Chicago 10, Ill.
Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.
Jefferson Union Co., 607 W. 26th St., New York 1, N. Y.
Jeffrey Mfg. Co., 859 N. Fourth St., Columbus 16, O.
Jenkins Bros., 100 Park Ave., New York 17, N. Y.
Jenn-Air Products Co., 1102 Stadium Drive, Indianapolis 7, Ind.
Jennison Co., The, 87 Putnam St., Fitchburg, Mass.
Jessop Steel Co., Washington, Pa.
Jet-Lube, Inc., 3093 N. California St., Burbank, Calif.
Jewel Mfg. Co., 1841 University Ave., St. Paul 4, Minn.
Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Johnson Bronze Co., 460 S. Mill St., New Castle, Pa.
Johnson Co., S. T., 940 Arlington St., Oakland, Calif.
Johnson Corp., The, 806 Wood St., Three Rivers, Mich.
Johnson Gas Appliance Co., 520 "E" Ave., N. W., Cedar Rapids, Ia.
Johnson Heater Corp., 1 Winnisimet St., Chelsea, Mass.
Johnson Machine Works, 619 Menomonie St., Eau Claire, Wis.
Johnson-March Corp., 1724 Chestnut St., Philadelphia 3, Pa.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Johnson Metal Hose, Inc., 10 Sperry St., Waterbury 20, Conn.
Johnson Plastics Corp., Box 312, Chagrin Falls, Ohio.
Johnson Service Co., 507 E. Michigan St., Milwaukee 1, Wis.
Johnson-Williams Inc., 2625 Park Blvd., Palo Alto, Calif.
Johnston Bros., Inc., Ferryburg, Mich.
Johnston & Chapman Co., 2925 Carroll Ave., Chicago 12, Ill.
Johnston & Jennings Co., 6917 Bessemer Ave., Cleveland 27, O.
Johnston Foil Mfg. Co., 6100 S. Broadway, St. Louis 11, Mo.
Johnston Pump Co., P. O. Bin "K", Pasadena 15, Calif.
JO-Line Tools, Inc., 8442 Otis St., South Gate, Calif.
Jones Machinery Div., Hewitt-Robins, Inc., 4401 Roosevelt Rd., Chicago.
Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.
Jordan & Co., Inc., Paul R., 311 E. South St., Indianapolis 25, Ind.
Jordan Corp., Div. of OPW Corp., 6013 Wiehe Ave., Cincinnati, O.
Josam Manufacturing Co., Corymbo Rd., Michigan City, Ind.
Joy Mfg. Co., Dept. 20, Henry W. Oliver Bldg., Pittsburgh 22, Pa.
Justrite Mfg. Co., 2061 N. Southport Ave., Chicago 14, Ill.

K

K-G Equipment Co., 1744 Lehigh St., Allentown, Pa.
KSM Products, Inc., Yale & Woodland Ave., Merchantville, N. J.
Kaiser Aluminum & Chemical Sales, Inc., Palmolive Bldg., 919 N. Michigan, Chicago, Ill.
Kaiser Co., E. B., 2114 W. Lake Ave., P. O. Box 47, Glenview, Ill.
Kalamazoo Div., New York Air Brake Co., Kalamazoo, Mich.
Kalamazoo Tank & Silo Co., Machine Tool Div., 500 Harrison St, Kalamazoo 16, Mich.
Kane Mfg. Corp., Kane, Pa.
Kates Co., W. A., The, 430 Waukegan Rd., Deerfield, Ill.
Kaufman Co., H. J., The, 13215 Roselawn Ave., Detroit 38, Mich.
Kaustine Furnace & Tank Corp., 1492 Washington Ave., Perry, N. Y.
Kawneer Co., Niles, Mich.
Kaye & McDonald, Inc., 11-15 Central Ave., West Orange, N. J.
Kaykor Industries, Inc., Yardville, N. J.
Kaylo Div., Owens-Illinois Glass Co., Box 1035, Toledo 1, O.
Keasbey Co., Robert A., 139-149 W. 19th St., New York, N. Y.
Keasbey & Mattison Co., Butler Ave., Ambler, Pa.
Keckley Co., O. C., 3400 Cleveland St., Skokie, Ill.
Keco Industries, Inc., 2832 Spring Grove Ave., Cincinnati, O.
Keeler Co., E., 238 West St., Williamsport 3, Pa.
Keeney Mfg. Co., Main St., Newington 11, Conn.
Kehm Corp., The, 5000 S. Halsted St., Chicago, Ill.
Keleket X-Ray Corp., 212 W. 4th St., Covington, Ky.
Keller Tool Div. of Gardner-Denver Co., P. O. Box 268, Grand Haven, Mich.
Kellogg Co., M. W., The, 225 Broadway, New York 7, N. Y.
Kelvinator Div., American Motors Corp., 14250 Plymouth Rd., Detroit, Mich.
Kenco Pump Div., American Crucible Products Co., 1305 Oberlin Ave., Lorain, O.
Kendall Co., Polyken Sales Div., 309 W. Jackson Blvd., Chicago 6, Ill.
Kenite Laboratory, Inc., 23 Samson Ave., P. O. Box 268, Madison, N. J.
Kennard Corp., 1819 S. Hanley Rd., St. Louis 17, Mo.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kenney Co., L. C., 2300 W. 59th St., Chicago 36, Ill.
Ken-Ray Brass Corp., Vermont, Ill.
Kensico Tube Co., Mt. Kisco, N. Y.
Kent Co., Inc., 716 Canal St., Rome, N. Y.
Kent-Moore Organization, Inc., 28635 Mound Rd., Warren, Mich.
Ken-Way Corp., Sparta, Wis.
Kern Co., John A., 224 N. Loomis St., Chicago 7, Ill.
Kerotest Div., Miller Printing Machinery Corp., 2525 Liberty Ave., Pittsburgh 22, Pa.
Kester Solder Co., 4201 Wrightwood Ave., Chicago 39, Ill.
Kewanee Boiler Div., American Radiator & Standard Sanitary Corp., 101 Franklin St., Kewanee, Ill.
Kewaunee Mfg. Co., Adrian, Mich.
Key-Hak Div., Producers & Distributors, Inc., 1321 Hanover Ave., Allentown, Pa.
Keystone Asphalt Products Co., 101 E. Ontario St., Chicago 11, Ill.
Keystone Carbon Co., Inc., 1935 State St., St. Marys, Pa.
Keystone Valve Corp., P. O. Box 6716, Houston 5, Tex.
Kice Metal Products Co., 485 South Washington Ave., Wichita 2, Kans.
Kidder Mfg. Co., Inc., J. F., 426 Colchester Ave., Burlington, Vt.
Kieley & Mueller, Inc., 64 Genung St., Middletown, N. Y.
Kilbury Mfg. Co., Inc., 14529 Hawthorne Blvd., Lawndale, Calif.
Kilgore, Inc., Westerville, O.
Killebrew Engineering Corp., 8640 Pardee Lane, St. Louis 23, Mo.
King Co. of Owatonna, The, 928 N. Cedar St., Owatonna, Minn.
King Engineering Corp., 945 Willard Ave., Ann Arbor, Mich.
King Refrigerator Co., 76-02 Woodhaven Blvd., Glendale, N. Y.
King Union Co., Inc., Hillsgrove, R. I.
King Zeero Co., The, 4300 — 14 W. Montrose Ave., Chicago 41, Ill.
Kingsford Foundry & Machine Wks., 264 W. Second St., Oswego, N. Y.
Kingsley Mfg. Co., 420 Howard Ave., New Haven, Conn.
Kingston-Conley, Inc., Div. of the Ohio Electric Mfg. Co., North Plainfield, N. J.
Kinney Mfg. Div., The New York Air Brake Co., 3529 Washington St., Boston 30, Mass.
Kirk & Blum Mfg. Co., 3120 Forrer St., Cincinnati 9, O.
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kisco Boiler & Engineering Co., 2414 Dekalb St., St. Louis 4, Mo.
Klauer Mfg. Co., 9th and Washington Sts., Dubuque, Ia.
Kleer Kleen Mfg. Co., 140 Orchard Ave., Hayward, Calif.
Klenk's Aviation Snips, 107 E. 5th St., Wilmington, Del.
Kling Bros., Engineering Works, 1320 N. Kostner Ave., Chicago 51, Ill.
Klipfel Valves, Inc., 1075 Lincoln Ave., Hamilton, O.
Knapp Bros. Mfg. Co., 16 East 72nd St., Cincinnati 16, O.
Knapp Mills, Inc., 23-15 Borden Ave., Long Island City 1, N. Y.
Knight, Maurice A., Kelly Ave., Akron 9, O.
Knobco, Inc., 2301 Alex, Newport, Ky.
Knowles Mushroom Ventilator Co., 160 Bellevue Ave., Upper Montclair, N. J.
Kobe Inc., 3040 E. Slauson, Huntington Park, Calif.
Koch Engineering Co., Inc., 321 W. Douglas, Wichita 2, Kans.
Koch Refrigerators, Inc., 401 Funston Rd., Kansas City 15, Kans.
Kody Blower Co., 1150 Southard St., Trenton 5, N. J.
Kol-Master Corp., 161 Walberg St., Oregon, Ill.
Kool-Kar Co., Inc., 1468 Penobscot Bldg., Detroit, Mich.
Kopperman & Sons, Joseph, 316 New St., Philadelphia 6, Pa.
Koppers Co., Inc., Koppers Bldg., Pittsburgh 19, Pa.
Koppers Company, Inc., Metal Products Div., 200 Scott St., Baltimore 3, Md.
Korfund Co., Inc., 48-01-F 32nd Pl., Long Island City 1, N. Y.
Koven & Bro. Inc., L. O., 154 Ogden Ave., Jersey City 7, N. J.
Kraissl Co., Inc., The, Terhune and Williams Aves., Hackensack, N. J.
Kraloy Plastic Pipe Co., Inc., 4720 E. Washington Blvd., Los Angeles, Calif.
Kramer Trenton Co., N. Olden & Breunig Aves., Trenton 5, N. J.
Kresky Mfg. Co., Inc., Second & H Streets, Petaluma, Calif.
Kritzer Radiant Coils, Inc., 2901 W. Lawrence Ave., Chicago 25, Ill.
Krueger Air Conditioning Co., 19 E. Rillito St., Tucson, Ariz.
Krueger Sentry Gauge Co., 1056 W. Mason St., Green Bay, Wis.
Kuhns Bros. Co., 1800 McCall St., Dayton 8, O.
Kulka Electric Mfg. Co., Inc., 633 S. Fulton Ave., Mt. Vernon, N. Y.
Kunkle Valve Co., 121 S. Clinton St., Ft. Wayne 2, Ind.

L

L. O. F. Glass Fibers Co., 1810 Madison Ave., Toledo 1, O.
LaBour Co., Inc., The, 1301 Sterling Ave., Elkhart, Ind.
Laclede Steel Co., Arcade Bldg., Rm. 1317, St. Louis 1, Mo.
Laclede Stoker Co., 4438 Hunt Ave., St. Louis 10, Mo.
La Crosse Steel Roofing & Corrugating Co., 227 Jay St., La Crosse, Wis.
Ladish Co., 5300 S. Packard Ave., Cudahy, Wis. (Milwaukee Suburb).
Ladish Co., Tri-Clover Div., 2809 60th St., Kenosha, Wis.
LaFavorite Rubber Mfg. Co., 256 Wagaraw Rd., Hawthorne, N. J.
Laharco Industries, 721-2nd Ave., N., Minneapolis 5, Minn.
Lake Chemical Co., 3052 W. Carroll Ave., Chicago 12, Ill.
Lakewood Engineering & Mfg. Co., 212 N. Carpenter St., Chicago 7, Ill.
Lamb Electric Co., Kent, O.
Lammert & Mann Co., Wood & Walnut Sts., Chicago 12, Ill.
Lamneck Div., Clayton & Lambert Mfg. Co., 1026 Lamneck St., Middletown, O.
Lamson & Sessions Co., The, 1971 W. 85th St., Cleveland 2, O.

Lancaster Heat Transfer Co., Inc., 123 DeKalb Ave., Brooklyn, N. Y.
Lancaster Pump & Mfg. Co., Manheim Rd., Lancaster, Pa.
Landis Machine Company, Fifth and Church Sts., Waynesboro, Pa.
Larkin Coils, Inc., 519 Memorial Dr., S. E., Atlanta 1, Ga.
Larkin Packer Co., Inc., P. O. Box 751, Waxahachie, Tex.
Lastik Products Co., Inc., 201 Iroquois Bldg., Pittsburgh 13, Pa.
Lattner Mfg. Co., P. M., 1411-9th St., S. W., Cedar Rapids, Iowa
Lau Blower Co., 2001 Home Ave., Dayton 7, O.
Lawler Automatic Controls, Inc., 453 N. MacQuesten Pkwy., Mount Vernon, N. Y.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
Lawrence Pumps Inc., 371 Market St., Lawrence, Mass.
Layne & Bowler, Inc., Box No. 6697, Hollywood Sta., Memphis 8, Tenn.
Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif.
Lead Lined Iron Pipe Co., 1 Broadway, Wakefield, Mass.
Leahy Mfg. Co., 1804 E. 8th St., Los Angeles, Calif.
Leavitt Machine Co., East River St., Orange, Mass.
Lecourtenay Co., 5 Maine St., Newark 5, N. J.
Ledeen Mfg. Co., 1600 S. San Pedro St., Los Angeles 15, Calif.
Lee Co., K. O., Aberdeen, S. D.
Lee Corp., P. O. Box 1801, Wilmington, Del.
Lee Vine Fin-Tube Radiator Co., Inc., 10 Fair St., New Haven, Conn.
Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lees Div., John, The, Serrick Corp., Batavia St., and Kilgore Ave., Muncie, Ind.
Lefax Publishers, 9th & Sansom, Philadelphia 7, Pa.
Leffel & Co., James, The, 426 East St., Springfield, O.
LE-HI Div., Hose Accessories Co., 2700 No. 17th St., Philadelphia 32, Pa.
Lehigh Fan & Blower Co., Div. of Fuller Co., 124 Bridge St., Catasauqua, Pa.
Lehigh Mfg. Co., Div. of Lehigh Inc., Lancaster, Pa.
Leibfried Mfg. Corp., C. H., 95 Guernsey, Brooklyn, N. Y.
Leiman Bros., Inc., 163 W. Christie St., Newark, N. J.
Leland Electric Co., The, Div. of American Machine & Foundry Co., 1501 Webster St., Dayton 1, O.
Lemlar Mfg. Co., 715 W. Redondo Beach Blvd., Gardena, Calif.
Lenco, Inc., 350 W. Adams St., Jackson, Mo.
Lenk Mfg. Co., 30 Cummington St., Boston 15, Mass.
Lennox Industries Inc., The, Marshalltown, Ia.
Lennox Industries, Inc., 1711 Olentangy River Rd., Columbus, O.
Lenz Co., 3301 Klepiner Rd., Dayton 1, O.
Leonard Precision Products Co., 9200 Bolsa Ave., Santa Ana, Calif.
Leonard Valve Co., 1360 Elmwood Ave., Cranston 7, R. I.
LeRoi Div., Westinghouse Air Brake Co., Milwaukee 1, Wis.
Leslie Co., 237 Grant Ave., Lyndhurst, N. J.
Leslie Welding Co., Inc., 2943 Carroll Ave., Chicago 12, Ill.
Levow, David, 308 W. 20th St., New York 11, N. Y.
Lewellen Mfg. Co., Columbus, Ind.
Lewin-Mathes Co., Lewin Metals Div., 1111 Chouteau Ave., St. Louis 2, Mo.
Lewis & Saunders, Lakeport, N. H.
Lewis Mfg. Co., Inc., 3044 S. W. 28th Lane, Miami 33, Fla.
Lewyt Air-Conditioner Corp., 5702 First Ave., Brooklyn, N. Y.
Lexsuco, Inc., 4815 Lexington Ave., Cleveland 3, O.
Leyman Mfg. Corp., John H. McGowan Co. Div., 1416 First National Bank Bldg., Cincinnati 2, O.
Libbey-Owens-Ford Glass Co., 608 Madison Ave., Toledo 3, O.
Libert Machine Co., 324 N. Roosevelt St., Green Bay, Wis.
Librascope, Inc., Commercial Div., 133 East Santa Anita Ave., Burbank, Calif.
Lidseen, Inc., Gustave, 1000 First St., Hayesville, N. C.
Lientz Co., B. P., P. O. Box 2275, Kansas City, Mo.
Lilie-Hoffmann Cooling Towers, Inc., 1450 So. Vandeventer Ave., St. Louis 10, Mo.
Lima Electric Motor Co., The, Lima, O.
Lima Register Co., The, 1790 N. Cable Rd., Lima, O.
LimiTorque Corp., Erie Ave. & G St., Philadelphia 34, Pa.
Lincoln Electric Co., The, 22801 St. Clair Ave., Cleveland 17, O.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Lindquist Pump Corp., 10001 W. Jefferson Blvd., Culver City 12, Calif.
Lindy Heaters, Inc., 2370 Hoffman St., New York 58, N. Y.
Line Material Co., Div. of McGraw Electric Co., 700 W. Michigan, Milwaukee, Wis.
Linear Incorporated, N. W. Cor. State Rd. & Levick St., Philadelphia 35, Pa.
Link-Belt Co., Prudential Plaza, Dept. HPAC-S7, Chicago 1, Ill.
Lintern Corp., Route 20 East, Painesville, O.
Lipman Refrigeration Div., Yates-American Co., Beloit, Wis.
Liquid Carbonic Corp., 3100 S. Kedzie Ave., Chicago 23, Ill.
Liquidometer Corp., 37-15 Skillman Ave., Long Island City 1, N. Y.
Lithcote Corp., 5000 W. Lake St., Melrose Park, Ill.
Little Brass Goods Co., M. S., 151 New Park Ave., Hartford 6, Conn.
Little Giant Vaporizer Co., Inc., 5101 Classen Blvd., P. O. Box 9545 Oklahoma City 18, Okla.
Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, O.
Locke Regulator Co., Walter and Osborne Sts., Salem, Mass.
Lockformer Co., The, 4615 W. Roosevelt Rd., Chicago 50, Ill.
Lockport Mills, Inc., Lockport, N. Y.
Logan Clay Products, Logan, O.
London Chemical Co., 1535 N. 31st Ave., Melrose Park, Ill.
Longergan Co., J. E., 2nd and Race Sts., Philadelphia 6, Pa.
Lookout Boiler & Mfg. Co., Compress St. & Mfrs. Rd., Chattanooga 1, Tenn.
Lord Mfg. Co., 1635 W. 12th St., Erie, Pa.
Lord & Clark Co., Inc., 791 Tremont St., Boston 18, Mass.
Louisville Drying Machinery Unit, General American Transportation Corp., 139 So. 4th St., Louisville 2, Ky.
Louvra Mfg. & Sales Co., 1010 Jeanette Ave., Union, N. J.
Lovejoy Flexible Coupling Co., 4987 W. Lake St., Chicago 44, Ill.
Lowell Wrench Co., 54 Commercial St., Worcester 8, Mass.
Lucey Boiler & Mfg. Corp., 1514 Chestnut St., Chattanooga, Tenn.
Ludlow Valve Mfg. Co., Inc., Rensselaer Valve Div., Foot of Adams St., Troy, N. Y.
Lufkin Rule Co., Saginaw, Mich.
Lug-All Co., The, 355 Lancaster Ave., Haverford, Pa.
Lukens Steel Co. and Divisions, 308 S. First Ave., Coatesville, Pa.
Lumm Co., A. H., 3151 South Ave., Toledo 9, O.
Lunkenheimer Co., Waverly & Beckman Sts., Cincinnati 14, O.
Lurie & Lurie, 560 W. Washington, Chicago 6, Ill.
Luzerne Rubber Co., Muirhead Ave., Trenton 7, N. J.
Lynch Asbestos Co., 2939 So. Sunol Drive, Los Angeles 23, Calif.
Lynch Corp., Crystal & Ames St., Anderson, Ind.
Lynchburg Foundry Co., Courtland Bldg., Lynchburg, Va.

M

M B Mfg. Co., 1060 State St., New Haven 11, Conn.
M & E Mfg. Co., 2757 Winthrop Ave., Indianapolis, Ind.
M & H Valve & Fittings Co., Div. of Walworth Co., Anniston, Ala.
M-M-A, Inc., Coho Bldg., Lancaster, Pa.
M M M, Inc., 1315 Hutchins, P. O. Box 2114, Houston, Tex.
Maas & Waldstein Co., 2121 McCarter Highway, Newark 4, N. J.
Macksons Co., 125 Cedar St., New York 6, N. Y.
Mac-Lean-Fogg Lock Nut Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
Madden Brass Products Co., P. O. Box 444, Aurora, Ill.
Madden Corp., The, 1345 Jarvis Ave., Chicago, Ill.
MaGirl Foundry & Furnace Co., 413 E. Oakland Ave., Bloomington, Ill.
Magnetic Seal Corp., 301 Sowams Rd., Barrington, R. I.
Magnetrol, Inc., 2110 S. Marshall Blvd., Chicago 23, Ill.
Magnode Products, Inc., Box 292, Trenton, O.
Magnus Chemical Co., South Ave., Garwood, N. J.
Mahon Co., R. C., The, P. O. Box 4666, Detroit 34, Mich.
Maid-O'-Mist, Inc., 3217 N. Pulaski Rd., Chicago 41, Ill.
Mall Tool Co., Div. of Remington Arms Co., Inc., 7740 South Chicago Ave., Chicago 19, Ill.
Malleable Iron Fittings Co., Branford, Conn.
Mallory Co., P. R., The, 3029 E. Washington, Indianapolis 6, Ind.
Mallory Sales Co., 13904 Lincoln Ave., Dolton, Ill.
Mammoth Furnace Co., 6425 Cambridge St., Minneapolis 16, Minn.
Manhattan Perforated Metal Co., Inc., 43-17 37th St., Long Island City 1, N. Y.
Manheim Mfg. & Belting Co., 325 Stiegel St., Manheim, Pa.
Manitowoc Shipbuilding, Inc., 16th & The River, Manitowoc, Wis.
Manning Co., Charles E., 90 Clairton Blvd., Pittsburgh 36, Pa.
Manning & Lewis Engineering Co., 32 Ogden St., Newark 4, N. Y.
Manning, Maxwell & Moore, Inc., 250 East Main St., Stratford, Conn.
Mansfield & Green, 1051 Power Ave., Cleveland 14, O.
Manufacturers Corp., 104 Ausdale Ave., P. O. Box 434, Mansfield, O.
Manufacturers Engineering & Equipment Corp., Hatboro, Pa.
Manville Boiler Co., Inc., Stiger St., Hackettstown, N. J.
Maplewood Machinery Co., Inc., 2634 Fullerton Ave., Chicago 47, Ill.
Marathon Electric Mfg. Corp., Cherry and Randolph Sts., P. O. Box 630, Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
March Mfg. Co., Inc., 8015 N. Lawndale Ave., Skokie, Ill.
Marco Co., Inc., 1000 Hess St., Saginaw, Mich.
Marco Industries, Inc., 3d & Franklin Sts., Womelsdorf, Pa.
Marion Machine Foundry & Supply Co., P. O. Box 989, Marion, Ind.
Marley Co., The, 222 West Gregory Blvd., Kansas City 14, Mo.
Marlin-Rockwell Corp., Jamestown, N. Y.
Marlo Coil Co., 6135 Manchester Ave., St. Louis 10, Mo.
Marlow Pumps, Division of Bell & Gossett Co., Ridgewood, N. J.
Marman Products Co., Inc., A Subsidiary of Aeroquip Corp., 11214 Exposition Blvd., Los Angeles 64.
Marquette Coppersmithing Co., Christian & Water Sts., Philadelphia 47, Pa.
Marquette Mfg. Co., Inc., 307 E. Hennepin Ave., Minneapolis 14, Minn.
Marsh Heating Equipment Co., 3501 Howard St., Skokie, Ill.
Marsh Instrument Co., 3501 Howard St., Skokie, Ill.
Marsh Refrigeration Equipment Co., Affiliate Jas. P. Marsh Corp., 3501 Howard St., Skokie, Ill.
Marsh Valve Co., 4th St. & Brigham Rd., Dunkirk, N. Y.
Marshalltown Mfg. Co., 901 E. Nevada, Marshalltown, Ia.
Marsto Machine Co., 231 Willard St., West Quincy 69, Mass.
Martin Co., Inc., J. O., 637 Minna St., San Francisco 3, Calif.
Martin Fan & Blower Co., 4634 W. 21st Pl., Chicago 50, Ill.
Martin & Sons, H. P., 801 W. 12th St., Owensboro, Ky.
Marvel Engineering Co., 7227 N. Hamlin Ave., Chicago 45, Ill.
Marviray, Inc., 54 Clifton St., Newark 5, N. J.
Mason-Neilan, Div. of Worthington Corp., Norwood, Mass.
Master-Bilt Refrigeration Mfg. Co., 920 Palm St., St. Louis 7, Mo.
Master Control Co., The, 2034 Fifth St., Cuyahoga Falls, O.
Master Electric Co., 126 Davis Ave., Dayton 1, O.
Master Fan Corp., 1323 Channing St., Los Angeles 21, Calif.
Master Mechanics Co., 2097 Columbus, Cleveland, O.
Master Products Co., 7000 S. Wentworth, Chicago 21, Ill.
Master Vibrator Co., 361 Stanley Ave., Dayton, Ohio.
Mathes Co., The, 1227 Broadway, Ft. Worth, Tex.
Matrix Engineering Corp., 3016 E. Lake St., Minneapolis 6, Minn.
Matthiessen & Hegeler Zinc Co., 9th & Sterling Sts., La Salle, Ill.
Maurath, Inc., 21800 Miles Ave., Cleveland 22, O.

Maurey Mfg. Corp., 2911 S. Wabash Ave., Chicago 16, Ill.
Maxitrol Co., 12200 Beech Rd., Detroit 39, Mich.
Maxon Premix Burner Co., Muncie, Ind.
May Company, Galesburg, Ill.
Mayer Refrigerating Engineers, Inc., Lincoln Park, N. J.
Mayne Products Co., 324 Harries Bldg., Dayton 2, O.
Mayson Mfg. Co., 4332 Horatio St., Detroit 10, Mich.
McAlear Mfg. Co., 1921 S. Western Ave., Chicago 8, Ill.
McAuley Trap Co., 104 First Ave., Pittsburgh 22, Pa.
McCord Corp., 2587 E. Grand Blvd., Detroit 11, Mich.
McCorkle Co., D. H., 6th & Bancroft Way, Berkeley 2, Calif.
McDonald Mfg. Co., A. Y., 12th & Pine Sts., Dubuque, Iowa.
McDonnell & Miller, Inc., 3500 N. Spaulding Ave., Chicago 18, Ill.
McGraw Electric Co., Clark Div., 5201 W. 65th St., Chicago 28, Ill.
McGraw Electric Co., Lonergan Mfg. Div., Edison & Clark St., Albion, Mich.
McIntire Co., The, Okner Parkway, P. O. Box 5, Livingston, N. J.
McKay Co., 1005 Liberty Ave., Pittsburgh 22, Pa.
McLarty Systems, 2600 Dickman Rd., Battle Creek, Mich.
McMillan Industrial Supplies, C. C., 3912 S. W. Dolph Court, Portland 19, Oregon.
McNeill Smoke Eliminator Co., 523 N. Halsted, Chicago, Ill.
McPherson Furnace & Supply Co., 1805 N. E. Second Ave., Portland 12, Ore.
McQuay, Inc., 1600 Broadway, N. E., Minneapolis 13, Minn.
McQuay-Norris Mfg. Co., Southwest Ave. at Marconi, St. Louis 10.
McRae Specialty Co., Don, 750 N. Glendale Ave., Glendale 6, Calif.
McWane Cast Iron Pipe Co., 1201 Vanderbilt Rd., Birmingham 2, Ala.
Mearlcrete Div., Mearl Mfg. Corp., 153 Waverly Pl., New York 14, N. Y.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., P. O. Box 223, Bridgeport, Pa.
Mechanical Industries Production Co., 217-223 Ash St., Akron 8, O.
Mechanical Products Corp., 168 N. Ogden Ave., Chicago 7, Ill.
Meier Electric & Machine Co., Inc., 3525 E. Washington St., Indianapolis 7, Ind.
Mel Products Co., The, 554 Chapel St., New Haven, Conn.
Melchior, Armstrong, Dessau Co. of Delaware, Inc., Ridgefield, N. J.
Meldon Industries Div., Tool Industries, Inc., 15438 Telegraph Rd., Detroit, Mich.
Memco, 1007 N. W. 36th St., Oklahoma City 18, Okla.
Memphis Pump & Mfg. Co., P. O. Box 3215, Memphis, Tenn.
Menardi & Co., 1222 E. Grand Ave., El Segundo, Calif.
Merchant & Evans Co., 2035 Washington Ave., Philadelphia 46, Pa.
Mercoid Corp., The, 4201 Belmont Ave., Chicago 41, Ill.
Mercury Clutch Div., Automatic Steel Products, Inc., Canton 6, O.
Mercury Hydraulics, Inc., 2440 Blake St., Denver 5, Colo.
Meriam Instrument Co., The, 10929 Madison Ave., Cleveland 2, O.
Mesker Steel Corp., Geo. L., 400 N. W. First St., Evansville 8, Ind.
Mesta Machine Co., West Homestead, Pittsburgh, Pa.
Metalcraft Inc., Mason City, Ia.
Metal Fabricators, Inc., P. O. Box 3232, Charlotte 3, N. C.
Metal Products Eng., Inc., 4000 Long Beach Ave., Los Angeles 58, Calif.
Metal & Thermit Corp., Rahway, N. J.
Metallo Gasket Co., 16 Bethany St., New Brunswick, N. J.
Metallurgical Products Dept. of General Electric Co., 11177 E. 8 Mile Rd., Detroit, Mich.
Metalweld, Inc., Protective Coatings Div., Scotts Lane & Abbotsford Ave., Philadelphia 29, Pa.
Met-L-Chek Co., 11919 S. Western Ave., Los Angeles 47, Calif.
Metropolitan Refining Co., Inc., 50-23 Twenty-Third St., Long Island City 1, N. Y.
Mettler Co., Inc., The, Div. of Eclipse Fuel Engineering Co., 4366 Worth St., Los Angeles 63, Calif.
Meyer & Bro. Co., F., 308 S. Commercial St., Peoria 2, Ill.
Meyer Furnace Co., The, P.O. Box 989, Peoria 1, Ill.
Meyer & Wenthe, Inc., 30 S. Jefferson St., Chicago, Ill.
Michael Electric Co., Inc., 15 Stiles St., New Haven, Conn.
Michigan Pipe Co., Gagetown, Mich.
Mic-Lin Co., Route 38 at Rudderow Ave., Maple Shade 6, N. J.
Micro Metallic Corp., 30 Sea Cliff Ave., Glen Cove, N. Y.
Micro Products Co., 20 N. Wacker Dr., Chicago 6, Ill.
Micro Switch Div. of Minneapolis-Honeywell Regulator Co., Chicago & Spring Sts., Freeport, Ill.
Microtron Corp., P. O. Box 2092, Charlotte, N. C.
Midco Register Corp., 1059 Grand Ave., St. Paul, Minn.
Mid-Continent Metal Products Co., 1960 Clybourn Ave., Chicago 14.
Midland Paint & Varnish Co., 3802 E. 91st St., Cleveland 5, O.
Mid-States Welder Mfg. Co., 6025 S. Ashland Ave., Chicago 36, Ill.
Midwest Air Conditioning Co., 510 Third St., Des Moines, Ia.
Midwest Automatic Control Co., 510 Third St., Des Moines, Ia.
Midwest Piping Co., Inc., 1450 S. Second St., St. Louis 4, Mo.
Miller Electric Mfg. Co., Inc., 718 S. Bounds St., Appleton, Wis.
Miller-Harris Instrument Co., 601 E. Ogden Ave., Milwaukee 2, Wis.
Miller Mfg. Co., 251 W. Kellog Blvd., St. Paul 2, Minn.
Miller Valve Co., Inc. P. O. Box 1255, Pittsburgh 30, Pa.
Millers Falls Co., 57 Wells St., Greenfield, Mass.
Mill-Rose Co., 1985 E. 59th St., Cleveland, O.
Milton Equipment Co., N. E. Cor. 4th Race St., Philadelphia 6, Pa.
Milton Roy Co., 1371 E. Mermaid Ave., Philadelphia 18, Pa.
Milwaukee Electric Tool Corp., 5362 W. State St., Milwaukee 8, Wis.
Milwaukee Gas Specialty Co., P. O. Box 461, Milwaukee, Wis.
Milwaukee Valve Co., S. Burrell St. at E. Hayes Ave., Milwaukee 7.
Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.
Minerallac Electric Co., 25 N. Peoria St., Chicago 7, Ill.
Minneapolis-Honeywell Regulator Co., 2753 4th Ave., S., Minneapolis 8, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.
Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., 411 Piquette, Detroit, Mich.
Minnesota & Ontario Paper Co., Investors Bldg., Minneapolis, Minn.
Minnesota Rubber & Gasket Co., 3630 Wooddale Ave., Minneapolis.
Minn-Kota Foundry & Mfg. Co., P. O. Box 822, Fargo, N. D.
Miracle Adhesives Corp., 250 Pettit Ave., Bellmore, N. Y.
Mir-O-Col Alloy Co., Inc., 340 North Ave., 21, Los Angeles 31, Calif.
Mirror Patented Stove Pipe Co., 55-65 Park St., Hartford 14, Conn.
Misener Mfg. Co., Inc., 200-8 Walton St., Syracuse 2, N. Y.
Mission Appliance Corp., 12611 Crenshaw Blvd., Hawthorne, Calif.
Mississippi Glass Co., St. Louis 7, Mo.
Mitchell Co., John E., 3800 Commerce St., Dallas, Tex.
Mitchell & Co., Inc., W. K., 29th & Ellsworth, Philadelphia 46, Pa.
Mitchell Mfg. Co., 2525 N. Clybourn Ave., Chicago, Ill.
Mitchell Radiation Products Corp., 128 E. Washington St., Norristown, Pa.
Modern Div., George Getz Corp., Rockford, Ill.
Modern Engineering Co., 3411 Pine Blvd., St. Louis 3, Mo.
Modern Hanger Co., 4734 Hough, Cleveland, Ohio.
Modernheat Cable Corp., Box 576, Kingsport, Tenn.
Modine Mfg. Co., 1509 De Koven Ave., Racine, Wis.
Moeller Instrument Co., 132nd St. & 89th Ave., Richmond Hill 18, N. Y.
Moeschl-Edwards Corrugating Co., Inc., The, P. O. Box 1115, Cincinnati 1, O.
Molco Drilling Machines, Inc., 1100 20th St., N. W., Washington 6, D. C.
Monarch Mfg. Works, Inc., 2501 E. Ontario St., Philadelphia 34, Pa.
Monash-Younker Co., Inc., 532 So. Throop St., Chicago 7, Ill.
Monitor Controller, 99 Grove St., Rockland, Mass.
Monogram Products Co., Inc., 731 N. 35th St., Philadelphia 4, Pa.
Monsanto Chemical Co., 800 N. 12th Blvd., St. Louis 1, Mo.
Monsanto Chemical Co., Merrimac Div., Everett Sta., Boston 49, Mass.
Montag Inc., 2011 N. Columbia Blvd., Portland 17, Ore.
Montgomery Bros., 1122 Howard St., San Francisco, Calif.
Montgomery Chemical Co., Jenkintown, Pa.
Moore Inc., Goodloe E., 2811 N. Vermilion, Danville, Ill.
Moore Co., The, 800 S. Missouri, Marceline, Mo.
Moore & Co., Samuel, Mantua, O.
Moore Dry Kiln Co., 1220 W. State St., Jacksonville, Fla.
Moore Products Co., H and Lycoming Sts., Philadelphia 24, Pa.
Moraine Products Div., General Motors Corp., Dayton 1, O.
Moran Flexible Joint Co., Div. of Railroad Products Co., 1551 Queen City Ave., Cincinnati 14, O.
Morehead Mfg. Co., 2455 W. Warren Ave., Detroit 8, Mich.
Moreheat Distribution Inc., 5608 Stewart Rd., Cincinnati 27, O.
Morey, Dan, 814 S. Robertson Blvd., Los Angeles 15, Calif.
Morganite, Inc., Carbon Specialties Div., 3304 48th Ave., Long Island City 1, N. Y.
Morrill Motors, 3685 Northrop, Ft. Wayne, Ind.
Morris Coupling & Clamp Co., P. O. Box 10, Kittanning, Pa.
Morris Sheet Metal Works, 635 W. Mound St., Columbus 23, O.
Morrison Brothers Co., 24th & Elm Sts., Dubuque, Ia.
Morrison Products, Inc., E. 168th St. and Waterloo Rd., Cleveland 10, O.
Morse Boulger Destructor Co., 80 5th Ave., New York 17, N. Y.
Morse Chain Co., Ithaca, N. Y.
Morse-Smith-Morse Co., The, 165 Dexter Ave., Watertown 72, Mass.
Mortell Co., J. W., Kankakee, Ill.
Morton Engineering Service, Paul S., 609 Bangor Rd., Lawrence, Mich.
Mt. Hawley Mfg. Co., Inc., Mt. Hawley Air Port, Peoria 4, Ill.
Mountain States Equipment Co., 1238 Speer Blvd., Denver 4, Colo.
Muckle Mfg. Co., Owatonna 3, Minn.
Mueller Brass Co., 1925 Lapeer Ave., Port Huron 1, Mich.
Mueller Climatrol, 2005 W. Oklahoma Ave., Milwaukee 15, Wis.
Mueller Co., 512 W. Cerro Gordo St., Decatur, Ill.
Muellermist Irrigation Co., 2612 S. 9th Ave., Maywood, Ill.
Mueller Steam Specialty Co., Inc., 40-20 22nd St., Long Island City 1, N. Y.
Mult-A-Frame Div., Ainsworth Mfg. Corp., 1471 E. Atwater St., Detroit 7, Mich.
Multi-Cell Sales Corp., 3420 Nicollet Ave., Minneapolis 8, Minn.
Multiple Corp., 1905 N. Main St., Dayton 5, O.
Multiplex Mfg. Co., Berwick, Pa.
Multi-Vent Div., Pyle-National Co., The, 1373 Kostner Ave., Chicago 51, Ill.
Muncie Gear Wks., Inc., 700 N. Wysor, Muncie, Ind.
Mund Boilers, Inc., 1600 N. Indiana St., Los Angeles 63, Calif.
Mundet Cork Corp., 7101 Tonnelle Ave., North Bergen, N. J.
Mundt & Sons, Charles, 53 Fairmount Ave., Jersey City 4, N. J.
Munn & Steele, Inc., Castle Island Terminal, South Boston, Mass.
Munray Products, Inc., 12400 Crossburn St., Cleveland, O.
Murray Co. of Texas, The, P. O. Box 1517, Atlanta, Ga.
Murray Iron Wks. Co., 1106 Washington St., Burlington, Ia.
Murray Mfg. Co., D. J., 1002-24 Third St., Wausau, Wis.
Mutual Liquid Gas & Equipment Co., 17129 S. Broadway, Gardena, Calif.
Myers & Bro. Co., F. E., The, Ashland, O.
Myers Electric Co., Inc., 209 First Ave., Pittsburgh 22, Pa.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., 2635 N. Kildare Ave., Chicago 39, Ill.

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Nash Engineering Co., 307 Wilson Ave., South Norwalk, Conn.

Nason Co., Clarkston, Mich.
National Acme Co., The, 170 E. 131st St., Cleveland 8, O.
National Airoil Burner Co., Inc., 1330 E. Sedgley Ave., Philadelphia 34, Pa.
National Aluminate Corp., 6215 W. 66th Pl., Chicago 38, Ill.
National Aniline Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
National Carbon Co., A Div. of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
National Cork Co., 1 Engle Street, Englewood, N. J.
National Cylinder Gas Co., 840 N. Michigan Ave., Chicago 11, Ill.
National Dust Collector Corp., 549 W. Washington, Chicago 6, Ill.
National Engineering & Mfg. Co., 16th & Lamine St., Sedalia, Mo.
National Engineering Products, Inc., Commerce and Savings Bldg., Washington, D. C.
National Gas Equipment Co., Inc., P. O. Box 11, Denison, Tex.
National Gypsum Co., 325 Delaware Ave., Buffalo, N. Y.
National Heater Co., 2475 Doswell Ave., St. Paul 8, Minn.
National Instrument Laboratories, Inc., 6108 Rhode Island Ave., Riverdale, Md.
National Lead Co., 111 Broadway, New York 6, N. Y.
National Lock Co., Inc., 1902 Seventh St., Rockford, Ill.
National Oil Burner Co. of N. Y., Inc., 614 Bergen St., Brooklyn, N. Y.
National Pipe Bending Co., 122 River St., New Haven 13, Conn.
National Pipe Coatings, Inc., 3480 East Randolph St., Huntington Park, Calif.
National-U. S. Radiator Corp., The, 944 Ash St., Johnstown, Pa.
National Steam Pump Co., 701 W. Johnson St., Upper Sandusky, O.
National Steel Construction Co., 301 Water St., Logansport, Ind.
National Super Service Co., Inc., 1944 N. 13th St., Toledo 2, O.
National Time & Signal Corp., 21800 Wyoming Ave., Detroit 37, Mich.
National Tube Div., United States Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.
National Valve & Mfg. Co., 3101 Liberty Ave., Pittsburgh 1, Pa.
Naugatuck Chemical Div., United States Rubber Co., Naugatuck, Conn.
Naylor Pipe Co., 1269 E. 92nd St., Chicago 19, Ill.
Nebel Mfg. Co., P. O. Box 3942, Shaker Square Sta., Cleveland 20, O.
Nebraska Boiler Company, Inc., 235 N. 9th St., Lincoln, Nebr.
Neff-Perkins Mfg. Co., 2130 St. Clair, Cleveland, O.
Nelson Foundry Co., 6116 Oakton, Morton Grove, Ill.
Nelson Mfg. Co., B. F., 401 Main St., N. E., Minneapolis 13, Minn.
Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.
Neptune Meter Co., 19 W. 50th St., New York 20, N. Y.
Nesbitt, Inc., John J., State Rd. & Rhawn St., Philadelphia 36, Pa.
New Departure Div., General Motors Corp., Bristol, Conn.
New England Carbide Tool Co., Inc., 55 Commercial St., Medford 55, Mass.
New Haven Copper Co., The, Seymour, Conn.
New Jersey Zinc Co., 160 Front St., New York 38, N. Y.
New York Air Valve Corp., 1850 Atlantic Ave., Brooklyn 33, N. Y.
New York Belting & Packing Co., 1 Market St., Passaic, N. J.
New York Blower Co., 3159 Shields Ave., Chicago 16, Ill.
New York Brass Foundry, 405 Broome St., New York 13, N. Y.
Newage International, Inc., 222 York Road, Jenkintown, Pa.
Newark Controls Co., 15 Ward St., Bloomfield, N. J.
Newark Wire Cloth Co., 351 Verona Ave., Newark 4, N. J.
Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Mich.
Newman Industries (America) Inc., 43 Broad St., New York 4, N. Y.
Newport Steel Corp., Ninth & Lowell Sts., Newport, Ky.
Niagara Blower Co., 405 Lexington Ave., Room 3516, New York 17.
Niagara Machine & Tool Wks., 637-697 Northland Ave., Buffalo 11, N. Y.
Niagara Products Co., 4311 E. Thomas Rd., Phoenix, Ariz.
Nice Ball Bearing Co., 30th and Hunting Park Ave., Philadelphia 40.
Nichols Instruments Co., 1115 N. Hunter St., Baltimore 2, Md.
Nicholson & Co., W. H., 178 Orgeon St., Wilkes-Barre, Pa.
Nielsen, Inc., E. V., 128 Broad St., Stamford, Conn.
Nikoh Tube Co., 5000 S. Whipple, Chicago 32, Ill.
Niphos Process Sales Corp., 19 Rector St., New York, N. Y.
Noera Mfg. Co., Div. Chase Brass & Copper Co., Waterbury 20, Conn.
Nooter Corp., 1400 S. Second St., St. Louis 4, Mo.
Norgren Co., C. A., 3400 So. Elati St., Englewood, Colo.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Norman Products Co., Inc., 1150 Chesapeake Ave., Columbus, O.
Norristown Asbestos Div., Nicolet Industries, Inc., Washington St., Norristown, Pa.
Norse Boiler Co., Inc., New Market, N. J.
North American Asbestos Corp., 141 W. Jackson Blvd., Chicago, Ill.
North American Mfg. Co., 4455 E. 71st St., Cleveland 5, O.
North American Mogul Products Co., The, Standard Bldg., Cleveland 13, O.
North American Philips Co., Inc., 750 S. Fulton Ave., Mt Vernon, N. Y.
North Shore Nameplate Co., 214-27 Northern Blvd., Bayside, N. Y.
Northern Blower Co., 6428 Barberton Ave., Cleveland 2, O.
Northern Indiana Brass Co., 935 Plum St., Elkhart, Ind.
Northern Ordnance Inc., Subsidiary of Northern Pump Co., Columbia Heights P. O., Minneapolis 22, Minn.
Norton Co., 1 New Bond, Worcester 6, Mass.
Norwalk Air Conditioning Corp., 138 Water St., S. Norwalk, Conn.
Norwalk Valve Co., South Norwalk, Conn.
Norwood Associated Engineers Inc., 904 Columbus Ave., Sprinfield, Mass.
Norwood Controls, A Unit of Detroit Controls, 934 Washington St., Norwood, Mass.
Novelty Steam Boiler Wks., Inc., Clare & Kolman Sts., Baltimore 30.
Nupla Mfg. Co., 1026 N. Sycamore, Los Angeles 38, Calif.
Nutmeg Chemical Co., 134 Haven St., New Haven, Conn.
Nu-way Corp., The, 2416 4th Ave., Rock Island, Ill.
Nye Tool Co., 4120-30 Fullerton Ave., Chicago 39, Ill.
Nylok Corp., The, 611 Industrial Ave., Paramus, N. J.

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OPW Corp., 2735 Colerain Ave., Cincinnati 25, O.
Oakite Products, Inc., 19 Rector St., New York 6, N. Y.
Obear & Son, W. F., 940 W. Florence Ave., P. O. Box 406, Inglewood 1, Calif.
Oberdorfer Foundries, Inc., 3007 Thompson Rd., Syracuse, N. Y.
O'Brien Steam Specialty Co., Inc., P. O. Box 217, Eastwood Station, Syracuse 6, N. Y.
Octagon Process, Inc., 15 Bank St., Staten Island 1, New York.
Octagon Ventilator Co., 5828-30 S. Oakley Ave., Chicago 36, Ill.
Ohio Brass Co., 380 N. Main St., Mansfield, O.
Ohio Electric Mfg. Co., The, 5400 Dunham Rd., Maple Heights, O.
Ohio Foundry & Mfg. Co., Penn R. R. & Slack St., Steubenville, O.
Ohio Injector Co., 275 Main St., Wadsworth, O.
Ohio Pipe Bending & Machine Co., 3900 Trent Ave., Cleveland 9, O.
Ohio Valley Hardware & Roofing Co., Inc., 801 N. W. Second St., Evansville, Ind.
Ohmlac Paint & Refining Co., Inc., 41-40 Crescent Ave., Long Island City, N. Y.
Oil Equipment Mfg. Corp., 169 Derby Ave., New Haven, Conn.
Okadee Co., 332 S. Michigan, Chicago, Ill.
Olin Mathieson Chemical Corp., Industrial Chemicals Div., Mathieson Bldg., Baltimore 3, Md.
Olin Mathieson Chemical Corp., Western Brass Mills Div., East Alton, Ill.
Olsen Mfg. Co., C. A., Elyria, O.
Olsen Testing Machine Co., Tinius Easton Rd., Willow Grove, Pa.
Olson & Co., Arthur A., Broad St., Canfield, O.
Omark Industries, 5001 S. E. Johnson Creek Blvd., Portland 6, Ore.
Omega Machine Co., Div. of B-I-F Industries, Inc., 381 Harris Ave., Providence 1, R. I.
Omega Products, 4700 W. Washington Blvd., Chicago 44, Ill.
O'Neil-Irwin Mfg. Co., 541 Eighth, Lake City, Minn.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Ormsby-Osterman, Inc., 3631 Cass Ave., St. Louis 13, Mo.
Orr & Sembower, Inc., Box 1138, Reading, Pa.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14, O.
Oshkosh Filter & Softener Co., 51 Ceape St., Oshkosh, Wis.
Oster Mfg. Co., Box 4326, Cleveland 32, O.
Oster Mfg. Co., John, 5055 N. Lydell Ave., Milwaukee 17, Wis.
OverHead Heaters Inc., 1612 Book Bldg., Detroit 26, Mich.
Owens Co., H., 9300 Venice Blvd., Culver City, Calif.
Owens & Co., Inc., Henry, 51 Washington Ave., Cranston 7, R. I.
Owens-Corning Fiberglas Corp., 1911 Nicholas Bldg., Toledo 1, O.
Oxy Catalyst, Inc., Wayne, Pa.
Oxygen Equipment & Service Co., 8335 S. Halsted St., Chicago 20.
Ozalid Div. of General Aniline & Film Corp., 1505 Ansco Rd., Johnson City, N. Y.

P

P-K Industries, Inc., 27 Porete Ave., North Arlington, N. J.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pacific Lumber Co., The, 100 Bush St., San Francisco 4, Calif.
Pacific Pumping Co., 9201 San Leandro Blvd., Oakland, Calif.
Pacific States Felt & Mfg. Co., Inc., 845 Howard St., San Francisco.
Pacific Steel Boiler Div., National-U. S. Radiator Corp., 944 Ash St., Johnstown, Pa.
Pacific Transducer Corp., 11836 W. Pico Blvd., Los Angeles 64, Calif.
Pacific Tube Co., 5710 Smithway St., Los Angeles 22, Calif.
Packard Electric Div., General Motors Corp., Warren, O.
Packard Mfg. Co., P. O. Box 719, Jacksonville, Fla.
Packless Metal Hose, Inc., 31-12 Winthrop Ave., New Rochelle, N. Y.
Page Steel & Wire, Div. of American Chain & Cable Co., Inc., Monessen, Pa.
Paine Co., 2 Westgate Rd., Addison, Ill.
Paley Mfg. Corp., 244 Herkimer St., Brooklyn 16, N. Y.
Palmer Electric Co., Inc., 230 E. Alexandrine, Detroit 1, Mich.
Palmer Mfg. Corp., 2200 W. Fillmore St., Phoenix, Ariz.
Palmer-Shile Co., 16072 Fullerton, Detroit 27, Mich.
Palmer Thermometers, Inc., 2501 Norwood Ave., Cincinnati (Norwood) 12, O.
Pangborn Corp., 400 Pangborn Blvd., Hagerstown, Md.
Pantex Mfg. Corp., Hydraulics Div., Pawtucket, R. I.
Paragon Electric Co., 1609 Twelfth St., Two Rivers, Wis.
Paragon-Revolute Corp., 61 South Ave., Rochester 4, N. Y.
Parish Co., 3310 Burgundy St., New Orleans 17, La.
Parker Appliance Co., The, 17325 Euclid Ave., Cleveland 12, O.
Parker Boiler Mfg. Co., Sid E., 2035 E. 37th St., Los Angeles 58, Calif.
Parker-Kalon Div., General American Transportation Corp., Clifton, N. J.
Parks-Cramer Co., P. O. Box 444, Fitchburg, Mass.
Parsons Co., Div. of Koehring Co., 200 N. 8th Ave., E., Newton, Ia.
Patco Mfg. Co., 231 N. Bread St., Philadelphia, Pa.
Patterson-Kelley Co., Inc., The, 465 Warren St., East Stroudsburg, Pa.
Paul-Lewis Laboratories, Inc., 4253 N. Port Washington Rd., Milwaukeee 12, Wis.
Paul Valve Corp., 683 Third Ave., New York 17, N. Y.
Payne Div. of Carrier Corp., 700 Royal Oaks Dr., Monrovia, Calif.
Peabody Engineering Corp., 232 Madison Ave., New York 16, N. Y.
Pease Co., C. F., The, 2601 W. Irving Park Rd., Chicago 18, Ill.
Peck, Stow & Wilcox Co., Center St., Southington, Conn.

Pecora Paint Co., Inc., 4th St., and Penna. R. R., Philadelphia 40, Pa.
Peden Equipment Co., 4512 Mt. Vernon, Houston, Tex.
Pedrick Tool & Machine Co., 3640 N. Lawrence St., Philadelphia 40, Pa.
Peer, Inc., 1440 Milton St., Benton Harbor, Mich.
Peerless of America, Inc., 5830 N. Pulaski Rd., Chicago 30, Ill.
Peerless Electric Co., 1401 W. Market St., Warren, O.
Peerless Heater Co., The, Div. of The Eastern Foundry Co., Boyertown, Pa.
Peerless Mfg. Corp., 14th & Ormsby, Louisville 10, Ky.
Peerless Products Div., United Cooling Towers, Inc., 1421 E. Washington Ave., North Little Rock, Ark.
Peerless Pump Div., Food Machinery & Chemical Corp., 301 West Ave. 26, Los Angeles 31, Calif.
Penberthy Mfg. Co., Div. of Buffalo Eclipse Corp., 1242 Holden Ave., Detroit 3, Mich.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Penn Brass & Copper Co., 3800 W. 20th St., Erie, Pa.
Penn Controls, Inc., P. O. Box 556, Goshen, Ind.
Penn Galvanizing Co., 2201 E. Tioga St., Philadelphia 34, Pa.
Penn Instruments Div. of Burgess-Manning Co., 4110 Haverford Ave., Philadelphia 4, Pa.
Penn Mfg. Corp. of Washington, Pa., 380 W. Chestnut St., P. O. Box 484, Washington, Pa.
Penn Ventilator Co., 3252 Goodman, Philadelphia 40, Pa.
Pennsylvania Flexible Metallic Tubing Co., 72nd St. & Powers Lane, Philadelphia 42, Pa.
Pennsylvania Forge Co., Milnor & Bleigh Sts., Philadelphia 35, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pennsylvania Salt Mfg. Co., Three Penn Center Plaza, Philadelphia 2, Pa.
Perfect Circle Corp., Hagerstown, Ind.
Perfecting Service Co., 332 Atlando Ave., Charlotte, N. C.
Perfection Industries Div., Hupp Corp., 1135 Ivanhoe Rd., Cleveland 4, O.
Perfex Plastics, Inc., 2632 S. Dearborn, Chicago, Ill.
Perkins & Son, Inc., B. F., Chicopee St., Holyoke, Mass.
Permacel Tape, New Brunswick, N. J.
Permaglass, Inc., Box 195, Station A, Toledo, O.
Permatex Co., Inc., P. O. Box 1, Brooklyn 35, N. Y.
Permutit Co., The, 330 W. 42nd St., New York 36, N. Y.
Perolin Co., Inc., The, 350 Fifth Ave., New York, N. Y.
Peters-Dalton, Inc., 17900 Ryan Rd., Detroit 12, Mich.
Petro, 3170 W. 106th St., Cleveland 11, O.
Petroleum Solvents Corp., 331 Madison Ave., New York 17, N. Y.
Petrometer Corp., 43-22 Tenth St., Long Island City 1, N. Y.
Phelps Dodge Copper Products Corp., 300 Park Ave., New York 22, N. Y.
Phelps Mfg. Co., 715 Thomas St., Little Rock, Ark.
Pheoll Mfg. Co., 5700 Roosevelt Rd., Chicago 50, Ill.
Philadelphia Gear Works, Inc., Erie Ave. & G St., Philadelphia 34, Pa.
Philadelphia Pipe Bending Co., 4135-65 N. Fifth St., Philadelphia 40.
Philadelphia Pump and Machinery Co., Inc., 13500 Philmont Ave., Philadelphia 16, Pa.
Philadelphia Thermometer Co., 6th & Cayuga St., Philadelphia 40, Pa.
Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Phillips & Co., H. A., 3255 W. Carroll Ave., Chicago 24, Ill.
Phillips Cooling Tower Co., Inc., 220 Dupont St., Brooklyn 22, N. Y.
Phillips Drill Co., U. S. No. 12 & Liberty Trail, Michigan City, Ind.
Phoenix Brass Fittings Corp., 354-378 Coit St., Irvington 11, N. J.
Phoenix Iron & Steel Co., Phoenixville, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Products Co., 4715 N. 27th St., Milwaukee 16, Wis.
Pick Mfg. Co., West Bend, Wis.
Picker X-Ray Co., 25 S. Broadway, White Plains, N. Y.
Pickett & Eckel, Inc., 1109 S. Fremont, Alhambra, Calif.
Pierce Co., Wm. B., The, 277 Military Rd., Buffalo 7, N. Y.
Piezo Mfg. Corp., 250 Arlington Ave., Staten Island, N. Y.
Pilley Brush Co., Fort Madison, Ia.
Pilot Mfg. Co., 3970 Pacific Coast Highway, Torrance, Calif.
Pines Engineering Co., Inc., 685 Walnut St., Aurora, Ill.
Pioneer Furnace Co., 3131 San Fernando Rd., Los Angeles, Calif.
Pioneer Pump Div., Detroit Harvester Co., 14300 Tireman Ave., Detroit 28, Mich.
Pioneer Tool Co., 908 10th St., Racine, Wis.
Pioneer Water Heater Corp., 3131 San Fernando Rd., Los Angeles, Calif.
Pipe Line Development Co., 5700 Detroit Ave., Cleveland 2, O.
Pipe Plugs, Inc., Wellington, O.
Piping Specialties, Inc., 114 Liberty St., New York 6, N. Y.
Pittsburgh Brass Mfg. Co., 3155 Penn Ave., Pittsburgh 1, Pa.
Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22, Pa.
Pittsburgh Lectrodryer Co., 327 32nd St., Pittsburgh 30, Pa.
Pittsburgh Nipple Wks., Inc., 1455 Spring Garden Ave., Pittsburgh 12, Pa.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna Pittsburgh 23, Pa.
Pittsburgh Pipe & Coupling Co., Allison Park, Pa.
Pittsburgh Piping & Equipment Co., 158 49th St., Pittsburgh 1, Pa.
Pittsburgh Plate Glass Co., 632 Ft. Duquesne Blvd., Pittsburgh 22, Pa.
Pittsburgh Steel Co., 800 Grant Bldg., Pittsburgh, Pa.
Pittsburgh Tube Co., 212 Wood St., Pittsburgh 22, Pa.
Pittsburgh Valve Co., Reedsville, W. Va.
Pittsfield Products, Inc., 2275 Platt Rd., Ann Arbor, Mich.
Plasteel Products Corp., McAdam Ave., Washington, Pa.
Plastergon Wall Board Co., Philadelphia Ave., Buffalo 7, N. Y.
Plastex Corp., 3232 Cleveland Ave., Columbus 24, O.
Plastic Products Co., 6467 Georgia Ave., Detroit 11, Mich.
Plastics Div., Eastman Chemical Products, Inc., Kingsport, Tenn.
Plastipipe, Products of Plastic Process Co., Div. of Monadnock Mills, 10400 Aviation Blvd., Los Angeles 45, Calif.
Plibrico Co., 1800 Kingsbury St., Chicago 14, Ill.
Plummer Spray Equipment Co., 700 Filmore St., Napoleon, O.
Poe Co., C. W., The, 10526 Wilbur Ave., Cleveland 6, O.
Pokorney Mfg. Co., 3117 Clybourn Ave., Chicago, Ill.
Polis Mfg. Co., J. D., 2900-20 W. 26th St., Chicago 23, Ill.
Polymer Corp. of Pa., The, 2120 Fairmont Ave., Reading, Pa.
Poole Foundry & Machine Co., 1700 Union Ave., Woodberry, Baltimore 11, Md.
Porce-Lin Tank Lining Co., 456 Milwaukee, Detroit, Mich.
Porous Plastic Filter Co., Glen Cove, N. Y.
Portable Electric Tools, Inc., 320 W. 83rd St., Chicago 20, Ill.
Porter-Cable Machine Co., 1714 N. Salina St., Syracuse 8, N. Y.
Porter & Co., Inc., H. W., 825 Frelinghuysen Ave., Newark 12, N. J.
Portland Copper & Tank Works, Inc., 80 Second St., South Portland, Me.
Portmar Boiler Co., Inc., 193 Seventh St., Brooklyn 15, N. Y.
Potter & Brumfield Inc., Princeton, Ind.
Potter Company, The, 1950 Sheridan Rd., North Chicago, Ill.
Potts-Farrington Co., 4250 Wissahickon Ave., Philadelphia 29, Pa.
Powell Co., Wm., The, 2525 Spring Grove Ave., Cincinnati 22, O.
Power Engineering Co., 205 West Wacker Dr., Chicago 6, Ill.
Powers Regulator Co., 3400 Oakton St., Skokie, Ill.
Prat-Daniel Corp., Thermobloc Div., 2 Meadow St., South Norwalk, Conn.
Pratt Co., Henry, 2222 S. Halsted St., Chicago 8, Ill.
Precision Parts Corp., 400 N. First St., Nashville 7, Tenn.
Precision Thermometer & Instrument Co., 1506 Brandywine St., Philadelphia 30, Pa.
Precision Welder Mfg. Co., 2218 W. Lake St., Chicago 12, Ill.
Preferred Utilities Mfg. Corp., 1860 Broadway, New York 23, N. Y.
Premier Co., 755 Woodlawn Ave., St. Paul 1, Minn.
Prepo Corp., Edgerton, Wis.
Presstite-Keystone Engineering Products Co., A Div. of American Marietta Co., 3900 Chouteau Ave., St. Louis 10, Mo.
Pressure Airduct Corp., 8130 N. St. Louis, Skokie, Ill.
Price Brothers, E. Monument Ave., Dayton, O.
Primor Products Div., Borg-Warner Corp., 2011 W. Beecher Rd., Adrian, Mich.
Pritchard & Co. of California, J. F., 4625 Roanoke Parkway, Kansas City 12, Mo.
Process Development, Inc., Genoa, O.
Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.
Production Stamping Co., 2316 S. 24th St., Omaha, Nebr.
Products Planning Co., Grant Bldg., Pittsburgh 19, Pa.
Products Research Co., 3126 Los Feliz Blvd., Los Angeles 39, Calif.
Propellair Div., Robbins & Myers Inc., 1345 Lagonda Ave., Springfield, O.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., 381 Harris Ave., Providence, R. I.
Protective Closures Co., 2207 Elmwood Ave., Buffalo 22, N. Y.
Protokap, Inc., 625 West Building, Houston, Tex.
Proto Tools, 2209 Santa Fe Ave., Los Angeles, Calif.
Prox Company, Inc., Frank, 1201 S. First St., Terre Haute, Ind.
Puhl & Hepper Mfg. Co., Inc., 6400 W. Florissant Ave., St. Louis 20
Pullman Vacuum Cleaner Co., 25 Buick St., Boston 19, Mass.
Pumpenbay Brugg K. Rutschi, Brugg, Switzerland
Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill.
Pur Air Div., Barnebey-Cheney Co., N. Cassady at 8th, Columbus 19, O.
Pure Carbonic Co., Div. of Air Reduction Co., Inc., 150 E. 42nd St., New York 17, N. Y.
Purolator Products, Inc., 970 New Brunswick Ave., Rahway, N. J.
Pyle-National Co., The, 1373 N. Kostner Ave., Chicago 51, Ill.
Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago 7, Ill.
Pypon Co., 410 Frick Bldg., Pittsburgh 19, Pa.
Pyramid Plastics, Inc., 554 W. Polk St., Chicago, Ill.
Pyrene CO TWO, U. S. Route 1, Newark, N. J.
Pyrolite Products Co., 1221-1231 W. 74th St., Cleveland 2, O.

Q

Q-P Mfg. Co., Needham Heights, Mass.
Quaid Fabrications, Inc., 157-167 W. Oxford St., Philadelphia 22, Pa.
Quaker City Iron Wks., Allegheny & Tulip St., Philadelphia 34, Pa.
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Comly & Milnor Sts., Philadelphia 24, Pa.
Quality Specialty Co., Inc., 28th & Lincoln Ave., Camden 5, N. J.
Quickdraft Co., Dueber-Hampden Bldg., P. O. Box 87-K, Canton, O.
Quick Joint Div., Automatic Bending Co., 469 E. 159th St., Harvey, Ill.
Quickwork Div., Whiting Corp., Harvey, Ill.
Quiet Automatic Oil Burner Corp., 33 Bloomfield Ave., Newark 4, N. J.
Quiet-Heet Mfg. Corp., Subsidiary of Emerson Radio & Phonograph Corp., 46 Oliver St., Newark 5, N. J.
Quigley Co., Inc., 415 Madison Ave., New York 17, N. Y.

R

R C S Tool Corp., 227-229 East Front St., P. O. Box 661, Bloomington, Ill.
R. I. Humidifier & Ventilating Co., Inc., 65 Landsdowne St., Cambridge 39, Mass.
R.K.L. Valve & Mfg. Co., Route 38 & Rudderow Ave., Maple Shade, N. J.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Radex Corp., 2076 N. Elston Ave., Chicago 14, Ill.

Radiant Baseboard Panels, Inc., 464 Hartford Ave., Newington, Conn.
Radiant Devices, 4030 Chouteau Ave., St. Louis, Mo.
Radiant Heat & Cooling Co., 795 Kifer Rd., Santa Clara, Calif.
Radiant Panel Mfg. Co., 9 E. Pearl St., Torrington, Conn.
Radiant Utilities Corp., 8817-18th Ave., Brooklyn 14, N. Y.
Radiator Specialty Co., 1700-1900 Dowd Rd., Charlotte 1, N. C.
Radio Corp. of America, RCA Victor Div., Front & Cooper, Camden, N. J.
Radio Corp. of America, Engineering Products Dept., Camden, N. J.
Raisler Corp., Grimes Sprinkler Div., 129 Amsterdam Ave., New York 23, N. Y.
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp., 12117 Berea Rd., Cleveland 11, O.
Ramsey Chain Co., Inc., 1029 Broadway, Albany 1, N. Y.
Ramtite Co., The, 2563 W. 18th St., Chicago 8, Ill.
Ranco, Inc., 601 W. 5th Ave., Columbus, O.
Randall Graphite Bearings, Inc., Greenlawn & Lake Sts., Lima, O.
Randolph-Page, Inc., 175 Fifth Ave., New York 10, N. Y.
Ransome Co., 4030 Hollis St., Emeryville, Calif.
Ra-Rich Mfg. Corp., Holtsville, Long Island, N. Y.
Ravena Iron Co., Ravena, N. Y.
Rawlplug Co., Inc., The, 200 Petersville Rd., New Rochelle, N. Y.
Ray Oil Burner Co., 1301 San Jose Ave., San Francisco 12, Calif.
Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.
Rayfield-Staffco Burner Co., 2066 Canalport, Chicago 8, Ill.
Raymond Div., Combustion Engineering, Inc., 1324 N. Branch St., Chicago, Ill.
Raypak Co., Inc., 4560 Worth St., Los Angeles, Calif.
Read Standard Corp., Blower-Stoker Div., 901 S. Richard St., York, Pa.
Reading Tube Corp., 350 - 5th Ave., New York, N. Y.
Ready-Power Co., The, 11231 Freud Ave., Detroit 14, Mich.
Reco Products Div., Recony Corp., 150 Nassau St., New York 38, New York.
Recoy Div. of Schemenauer Mfg. Corp., Holland, O.
Rector Mineral Trading Corp., 551 Fifth Ave., New York 17, N. Y.
Red Jacket Co., Inc., 513 Bell Ave., Carnegie, Pa.
Red Jacket Mfg. Co., 1051 S. Rolff St., Davenport, Ia.
Red Spot Electric Co., 7405 S. Tacoma Way, Tacoma 9, Wash.
Redi-Bolt, Inc., 5334 Indianapolis Blvd., East Chicago, Ind.
Redmond Co., Inc., Owosso, Mich.
Reed Mfg. Co., 1425 W. 8th St., Erie, Pa.
Reed Unit-Fans, Inc., 1001 St. Charles Ave., New Orleans 8, La.
Reeves Pully Co., Div. of Reliance Electric & Engineering Co., Columbus, Ind.
Reeves Steel & Mfg. Co., Dover, O.
Reflectal Corp. Subsid., Borg-Warner Corp., 310 S. Michigan Ave., Chicago 4, Ill.
Reflectotherm, Inc., 26 East Unversity Ave., Cincinnati 19, O.
Reflin Co., 5730 Kearney Villa Rd., San Diego 11, Calif.
Refractory & Insulation Corp., 120 Wall St., New York 5, N. Y.
Refrigerating Specialties Co., 3004 W. Lexington St., Chicago, Ill.
Refrigeration Appliances, Inc., 917-923 W. Lake St., Chicago, Ill.
Refrigeration Devices Co., 51 E. Centre St., Nutley 10, N. J.
Refrigeration Engineering, Inc., 7250 E. Slauson Ave., Los Angeles 22.
Rega Mfg. Co., 79 Mt. Hope Ave., Rochester 20, N. Y.
Register & Grille Mfg. Co., Inc., 70 Berry St., Brooklyn 11, N. Y.
Reichert Float & Mfg. Co., 2242 Smead Ave., Toledo 6, O.
Reif-Rexoil, Inc., 37-41 Carroll St., Buffalo 3, N. Y.
Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis 4, Ind.
Reiner & Campbell Co., Inc., 19 Euclid Ave., P. O. Box 5035, Newark 5, N. J.
Reintjes Co., Geo. P., 2517-19 Jefferson St., Kansas City, Mo.
Reliable Perforating Co., 2047 N. Wood St., Chicago, Ill.
Reliance Automatic Lighting Co., 1929 Mead St., Racine, Wis.
Reliance Electric & Engineering Co., 1088 Ivanhoe Rd., Cleveland 10.
Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland 3, O.
Reliance Instrument Mfg. Corp., 190 Glen Cove Ave., Glen Cove, Long Island, N. Y.
Reliance Refrigerating Machine Co., 3401 N. Kedzie Ave., Chicago.
Remco, Inc., Zelienople, Pa.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Remington Arms Co., Inc., Bridgeport, Conn.
Rempe Co., 342 N. Sacramento Blvd., Chicago 12, Ill.
Republic Flow Meters Co., 2240 Diversey Pkwy., Chicago 47, Ill.
Republic Mfg. Co., 15655 Brookpark Rd., Cleveland 11, O.
Republic Products Co., 7420 State Rd., Philadelphia 36, Pa.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown 1, O.
Republic Steel Corp., Republic Bldg., Cleveland 1, O.
Republic Steel Corp., Bolt & Nut Div., 1970 Carter Rd., Cleveland 13.
Republic Steel Corp., Steel & Tubes Div., 224 E. 131st St., Cleveland 8, O.
Research Appliance Co., Rt. 8 at Craighead Rd., Box 307, Allison Park, Pa.
Research-Cottrell, Inc., Bound Brook, N.J.
Research Products Corp., 1015 E. Washington Ave., Madison 10, Wis.
Research Vacuum Supply Co., 6712 N. Clark St., Chicago 26, Ill.
Resisto Pipe & Valve Co., 262 Bridge St., East Cambridge, Mass.
Resistoflex Corp., Roseland, N. J.
Resolite Corp., Zelienople, Pa.
Reuland Electric Co., 3001 W. Mission Rd., Alhambra, Calif.
Revcor Inc., Carpentersville, Ill.
Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
Revere Copper & Brass, Inc., Standard Rolling Mills Div., 196 Diamond St., Brooklyn 22, N. Y.
Rex Clay Products Co., 7717 Lyndon, Detroit 38, Mich.
Rex Welder Company, 409 Southwest Blvd., Kansas City 8, Mo.
Reynolds Electric Co., 3000 River Rd., River Grove, Ill.
Reynolds Mfg. Co., The, Box 333, Comstock Park, Mich.
Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.
Reynolds Shaffer Co., 12100 Cloverdale Ave., Detroit 4, Mich.
Reznor Mfg. Co., 51 Union St., Mercer 8, Pa.
Rheem Mfg. Co., 7600 Kedzie Ave., Chicago 29, Ill.
Rhoads & Sons, J. E., 2100 W. 11th St., Wilmington 99, Del.
Rhode Island Fittings Co., 355 Dexter St., Providence 7, R. I.
Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford, Conn.
Rhopac, Inc., 3425 Cleveland St., Skokie, Ill.
Richland Co., 104 Ausdale Ave., P. O. Box 219, Mansfield, O.
Richmond Engineering Co., 7th and Hospital Sts., Richmond, Va.
Richmond Foundry & Mfg. Co., Inc., The, Hermitage Rd., Richmond, Va.
Richmond Plumbing Fixtures Div., Rheem Mfg. Co., Box 111, Metuchen, N. J.
Richmont, Inc., 922 S. Myrtle Ave., Monrovia, Calif.
Ric-wiL, Inc., Barberton, O.
Ridge Tool Co., Clark St., Elyria, O.
Rid-Sludge Div., Aulwood Mfg. Co., 777 Raymond Ave., St. Paul, Minn.
Rigidbilt Inc., 2850 W. Fulton St., Chicago 12, Ill.
Rigidized Metals Corp., 721 Ohio St., Buffalo 3, N. Y.
Riley Stoker Corp., 9 Neponset St., Worcester, Mass.
Rinehart Inc., 511-513 Main St., Richmond, Ind.
Ripley Co., Inc., Middletown, Conn.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Rite Engineering & Mfg. Corp., 144 S. Mission Rd., Los Angeles, Calif.
Ritter Pattern & Casting Co., Inc., 120 Walker St., New York 13, N. Y.
Rittling Corp., The, Rittling Bldg., Buffalo 5, N. Y.
Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, O.
Roberson Co., L. N., 1539 E. 103rd St., Seattle 55, Wash.
Robert Mfg. Co., 9035 Venice Blvd., Los Angeles 34, Calif.
Roberts-Gordon Appliance Corp., 44 Central Ave., Buffalo 6, N. Y.
Roberts Tube Div., Prestyle Mfg. Co., 6100 Ranspach Ave., Detroit, Mich.
Robertson Co., H. H., 2400 Farmers Bank Bldg., Pittsburgh 22, Pa.
Robinson Aviation, Inc., Teterboro Air Terminal, Teterboro, N. J.
Robinson Clay Product Co., The, 65 W. State St., Akron 9, O.
Robinson Corp., P. O. Box 709, Somerville, N. J.
Robinson Industries, Coleman, Mich.
Robinson Ventilating Co., Zelienople, Pa.
Robvon Backing Ring Co., 675 Garden St., Elizabeth 2, N. J.
Rochester Lead Works, Inc., 380 Exchange St., Rochester 8, N. Y.
Rochester Mfg. Co., Inc., 63 Rockwood St., Rochester 10, N. Y.
Rock Island Register Co., 2435 Fifth Ave., Rock Island, Ill.
Rockford Brass Works, 700 S. Main, Rockford, Ill.
Rockford Screw Products Co., 2501 Ninth St., Rockford, Ill.
Rockwell Co., W. S., 2545 Eliot St., Fairfield, Conn.
Rockwell Mfg. Co., Meter & Valve Div., 400 N. Lexington Ave., Pittsburgh 8, Pa.
Rockwood Sprinkler Co., 38 Harlow St., Worcester 5, Mass.
Roddick Tool Co., P. O. Box 109, Anaheim, Calif.
Roessing Mfg. Co., 1616 Noble St., Sharpsburg, Pittsburgh 15, Pa.
Roller Bearing Co. of America, Sullivan Way, West Trenton, N. J.
Rome-Turney Radiator Co., Canal St., Rome, N. Y.
Ronor Corp., 1360 W. 9th St., Cleveland 13, O.
Roots-Connersville Blower Div., 900 W. Mount St., Connersville, Ind.
Roper Corp., Geo. D., Blackhawk Park Ave., Rockford, Ill.
Rosebraugh Co., W. W., 680 S. 17th St., Salem, Ore.
Rosedale Foundry & Machine Co., Columbus & Preble Aves., N. S., Pittsburgh, Pa.
Ross Engineering Corp., J. O., 444 Madison Ave., New York 22, N. Y.
Ross Heat Exchanger Div., American Radiator & Standard Sanitary Corp., 1407 West Ave., Buffalo, N. Y.
Ross Sprinkler Co., 4333 Temple City Blvd., Rosemead, Calif.
Ross Valve Mfg. Co., Inc., 6 Oakwood Ave., Troy, N. Y.
Rotary Concrete Drill Co., 650 S. Arroyo Pkwy., Pasadena, Calif.
Rotary Seal Div., Muskegon Piston Ring Co., 2020 N. Larrabee St., Chicago 14, Ill.
Roth Co., Roy E., 2420-A 24th Ave., Rock Island, Ill.
Rotherm Engineering Co., Inc., 7280 W. Devon, Chicago, Ill.
Rotometals, 980 Harrison St., San Francisco 7, Calif.
Rotor Tool Co., 26300 Lakeland Blvd., Cleveland 32, O.
Round Oak Co., Inc., Dowagiac, Mich.
Royal Mfg. Corp., Waterloo, Ind.
Royalton Co., Inc., Gasport, N. Y.
Royco Instruments, 720 Arthur St., Albany, Calif.
Royersford Foundry & Machine Co., Inc., 101-131 Main St., Royersford, Pa.
Roylyn, Inc., 1706 Standard Ave., Glendale 1, Calif.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Rubber & Asbestos Corp., 225 Belleville Ave., Bloomfield, N. J.
Rubber & Plastics Compound Co., 10 Rockefeller Plaza, New York 20, N. Y.
Ruberoid Co., 500 Fifth Ave., New York 18, N. Y.
Ruby Chemical Co., 74 McDowell St., Columbus 16, O.
Ruemelin Mfg. Co., 3860 N. Palmer St., Milwaukee 12, Wis.
Ruggles-Klingemann Mfg. Co., 110 Tremont St., Boston, Mass.
Ruppright's Rotary Roof Cooler, Box 43555, Los Angeles 43, Calif.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Russell Co., F. C., The, 1100 Chester Ave., Clevelend 1, O.
Rust-Oleum Corp., 2425 Oakton St., Evanston, Ill.
Ruthman Machinery Co., 1809 Reading Rd., Cincinnati 2, O.
Rutland Fire Clay Co., Curtis Ave., Rutland, Vt.
Ruud Mfg. Co., Kalamazoo, Mich.
Ryerson & Son, Inc., Joseph T., 2558 W. 16th, Chicago, Ill.

S

S&C Mfg. Co., 6245 Wiehe Rd., Cincinnati, O.
SKF Industries, Inc., Front St., & Erie Ave., Philadelphia 32, Pa.

S.O.S. Products Co., Inc., 346 Cumberland St., Brooklyn 38, N. Y.
Sac Tool Mfg. Co., 1913 Washington Ave., St. Louis 3, Mo.
St. Clair Rubber Co., 440 E. Jefferson, Detroit, Mich.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., 1948 N. 9th St., St. Louis 6.
St. Louis Tool Co., 6100 Prescott St., St. Louis 15, Mo.
St. Paul Corrugating Co., S. Wabasha and Water Sts., St. Paul 1.
Sales & Co., Murray W., 801 W. Baltimore Ave., Detroit 2, Mich.
Salina Metal Products Co., 9th and Bishop, Salina, Kan.
Sall Bros. Co., 2320 Kishwaukee St., Rockford, Ill.
Sall Mountain Div., Nicolet Industries, Inc., Box 777, Hamilton, O.
Salsbury Corp., 1161 E. Florence Ave., Los Angeles 1, Calif.
Sampson Chemical & Pigment Corp., 2830 W. Lake St., Chicago 12, Ill.
San Angelo Foundry & Machine Co., P. O. Box 1152, San Angelo, Tex.
San Gabriel Boiler Mfg. Co., 330 S. Del Mar Pl., P. O. Box 2, San Gabriel, Calif.
Sandee Mfg. Co., 5050 W. Foster Ave., Chicago 30, Ill.
Sandstrom Products Co., Port Byron, Ill.
Sangamo Electric Co., 1301 N. 11th St., Springfield, Ill.
Santa Fe Tank & Tower Co., Inc., 5401 S. Boyle Ave., Los Angeles 11.
Sante Fe Tank & Tower Co. of Texas, an Affiliate of Fluor Products Co., P. O. Box 278, Garland, Tex.
Saran Lined Pipe Co., 2415 Burdette Ave., Ferndale 20, Mich.
Sarco Co., Inc., Empire State Bldg., New York 1, N. Y.
Sarcotherm Controls, Inc., Empire State Bldg., New York 1, N. Y.
Sargent Enginairing Co., 1375 E. 45th St., Cleveland 3, O.
Sauereisen Cements Co., 1045 North Canal St., Pittsburgh 15, Pa.
Saunders Mfg. Co., 25 Atherton St., Yonkers, N. Y.
Saverite Engineering Co., 158 - 14th St., Hoboken, N. J.
Sawhill Tubular Products, Inc., P. O. Box 546, Sharon, Pa.
Scaife Co., 26 Ann St., Oakmont, Pa.
Schade Valve Mfg. Co., 2527 N. Bodine St., Philadelphia 33, Pa.
Schaevitz Engineering, Camden 1, N. J.
Schaible Co., The, 5801 Mariemont Ave., Mariemont 27, O.
Scharer & Co., Ray A., 3000 East Grand Blvd., Detroit 2, Mich.
Scharf Mfg. Co., J. H., 6120 Binney St., Omaha, Nebr.
Schatz Mfg. Co., The, Fairview, Poughkeepsie, N. Y.
Schaub Engineering Co., Fred H., 2110 S. Marshall Blvd., Chicago 23.
Schaul Mfg. Co., 6300 Rowland Ave., Cleveland 27, O.
Schecter Brothers Co., Hancock and Huntingdon Sts., Philadelphia 33.
Schieren Co., Chas. A., 30-38 Ferry St., New York 38, N. Y.
Schlegel Mfg. Co., 277 N. Goodman, Rochester 7, N. Y.
Schild Mfg. Co., 4127 — N. 60th St., Milwaukee 16, Wis.
Schmieg Industries, Inc., P. O. Box 4701, Detroit 34, Mich.
Schnacke, Inc., 1101 N. Governor St., Evansville, Ind.
Schneible Co., Claude B., P. O. Box 81, No. End Station, Detroit 2.
Schoedinger, Inc., F. O., 322-358 Mt. Vernon Ave., Columbus 16, O.
Schramm, Inc., West Chester, Pa.
Schurs Oil Burner Co., 8500 Zamore Ave., Los Angeles 1, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Schwitzer Corp., 1125 Massachusetts Ave., Indianapolis 7, Ind.
Sciaky Bros. Inc., 4915 W. 67th St., Chicago 38, Ill.
Scientific Instrument Co., 617 Howard St., Detroit 26, Mich.
Scott Valve Mfg. Co., 3963 McKinley Ave., Detroit 8, Mich.
Scovill Mfg. Co., Waterville Div., Waterville 14, Conn.
Screw Machine Products Co., 7737 N. E. Killingsworth, P. O. Box 7497, Portland 20, Ore.
Scully-Jones & Co., Instrument Div., 1901 South Rockwell St., Chicago 8, Ill.
Sealed Power Corp., 2001 Sanford St., Muskegon 61, Mich.
Sealed Unit Parts Co., Inc., 261 E. 161st St., Bronx 51, N. Y.
Sealmaster Bearings, Div. of Stephens-Adamson Mfg. Co., 47 Ridgeway Ave., Aurora, Ill.
Sealol Corp., Warwick Industrial Park, Providence 5, R. I.
Seamless Rubber Co., The, F.O.S. Industrial Tape Div., 464 Congress Ave., New Haven 3, Conn.
Seamlex Co., Inc., 41-23 24th St., Long Island City 1, N. Y.
Security Valves Corp., 541 W. Garfield, Glendale, Calif.
Seelye Craftsman, 984 Central Ave., Minneapolis, Minn.
Seiberling Rubber Co., Plastics Div., Newcomberstown, O.
Selas Corp. of America, Dresher, Pa.
SelecTemp Div., Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland 11, O.
Self Cleaning Strainer Co., 4545 Southwest Highway, Oak Lawn, Ill.
Sellers Engineering Co., 4874-76 N. Clark St., Chicago 40, Ill.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
Servel, Inc., 119 Morton Ave., Evansville 20, Ind.
Seton Name Plate Co., 394-B Central Ave., New Haven 15, Conn.
Sette Products Co., 1241 High St., Oakland 1, Calif.
Sexauer Mfg. Co., Inc., J. A., Dept. 19, 2503-05 3rd Ave., New York 51, N. Y.
Shafer Bearing, Div. of Chain Belt Co., 801 Burlington Ave., Downers Grove, Ill.
Shakeproof Div., Illinois Tool Wks., St. Charles Rd., Elgin, Ill.
Shallcross Co., 48th and Grays Ferry Rd., Philadelphia 43, Pa.
Shallcross Controls, Inc., 2217-21 N. 31st St., Milwaukee 8, Wis.
Shank Co., Cyrus, 4646 W. 12th Pl., Chicago 50, Ill.
Sharon Steel Corp., Sharon, Pa.
Shaw Co., Benjamin F., Second & Lombard Sts., Wilmington 99, Del.
Shaw-Kendall Engineering Co., 128 S. Superior St., Toledo 4, O.
Shaw-Perkins Mfg. Co., 201 E. Carson St., Pittsburgh 19, Pa.
Sheldon Equipment Co., E. H., 716 Nims St., Muskegon, Mich.
Shell Oil Co., Lubricants Dept., 37-06 82nd St., Jackson Heights, Long Island, N. Y.
Sherwin-Williams Co., The, 101 Prospect Ave., N. W., Cleveland, O.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Shutt Process Equipment Corp., 1421 Norman Place, St. Louis 22, Mo.
Siemon Mfg. Co., Grandview, Mo.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Sight Feed Generator Co., P. O. Box 38, West Alexandria, O.
Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Signal Indicator Corp., 42 Stewart Ave., Brooklyn 37, N. Y.
Sikes Co., S. R., 1028 S. Third St., Minneapolis 15, Minn.
Silco Products, Inc., 437 Harding St., Minneapolis, Minn.
Silent Glow Oil Burner Co., 850 Windsor St., Hartford, Conn.
Silvercote Products, Inc., 161 E. Erie St., Chicago 11, Ill.
Silvercraft, Inc., 120 S. Floyd St., Louisville, Ky.
Simplaire, 521 Fifth Ave., New York 17, N. Y.
Simplex Ceiling Corp., 552 W. 52nd St., New York 19, N. Y.
Simplex Mfg. Co., 198 N. Main St., Fond du Lac, Wis.
Simplex Oil Heating Corp., 7901 Oxford, Philadelphia 11, Pa.
Simplex Valve & Meter Co., 68th and Upland Sts., Philadelphia 42, Pa
Simpson Electric Co., 5208 W. Kinzie, Chicago, Ill.
Sims Co., 18th & Whitley Sts., Erie, Pa.
Sims Pump Valve Co., 1314 Park Ave., Hoboken, N. J.
Sioux Steel Co., P. O. Box 898, Sioux Falls, S. D.
Sipe & Co., James B., Box 8010, Pittsburgh 16, Pa.
Skidmore Corp., P. O. Box 309, St. Joseph, Mich.
Skilbeck Mfg. Co., 7432 27th Ave., Kenosha, Wis.
Skil Corp., 5033 Elston Ave., Chicago 30, Ill.
Skinner Co., M. B., 3502 W. Sample, South Bend 21, Ind.
Skinner Electric Valve Div., The Skinner Chuck Co., Edgewood Ave. New Britain, Conn.
Skinner Engine Co., 337 W. 12th St., Erie, Pa.
Skinner Irrigation Co., 121 E. Canal St., Troy, O.
Skyline Industries, Titusville, Pa.
Slant-Fin Radiator Corp., 87-49 130th St., Richmond Hill 18, N. Y.
Sly Mfg. Co., W. W., 4700 Train Ave., P. O. Box 5939, Cleveland 1, O
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Smith-Blair, Inc., 535 Railroad Ave., S. San Francisco, Calif.
Smith Bros. Co., 414 S. Harvey, Oak Park, Ill.
Smith Chemical Co., E. W., 15020 E. Proctor Ave., La Puente, Calif.
Smith Co., Inc., H. B., The, 64 Main St., Westfield, Mass.
Smith Co., J. B., 3327 B St., Philadelphia 34, Pa.
Smith Co., S. Morgan, Lincoln & Hartley Sts., York, Pa.
Smith Corp., A. O., 3533 N. 27th St., Milwaukee 1, Wis.
Smith Corp., A. O., Electric Motor Div., 531 No. 4th St., Tipp City, O.
Smith Filter Corp., 1603-2 Ave., Moline, Ill.
Smith & Kanzler Corp., E. Linden Ave., Linden, N. J.
Smith Products Co., 43642 Nine Mile Rd., Northville 1, Mich.
Smith & Serrell, Inc., 200 Washington St., Newark 2, N. J.
Smith Twin Tubular Boiler Co., Inc., Cottman St., at State Rd., Philadelphia 35, Pa.
Smith Welding Equipment Corp., 2633 S. E. Fourth St., Minneapolis 14, Minn.
Smolensky Valve Co., Inc., 940 Broadway, Bedford, O.
Smooth-On Mfg. Co., 568-574 Communipaw Ave., Jersey City 4, N. J
Snap-on Tools Corp., Kenosha, Wis.
Snap-Tite, Inc., Union City, Pa.
Socony-Mobil Oil Co., Inc., 150 E. 42nd St., New York 17, N. Y.
Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill.
Solar Aircraft Co., 2200 Pacific Highway, San Diego 12, Calif.
Soldering Specialties Co., 19 Chatam Rd., Summit, N. J.
Solfo Paint Mfg. Co., Metco Div., Trenton 3, N. J.
Solvay Process Div., Allied Chemical & Dye Corp., 61 Broadway, New York 6, N. Y.
Somers Corp., 6063 Wabash Ave., Detroit 8, Mich.
Somerville Iron Works, Inc., Chattanooga, Tenn.
Sonneborn Sons, Inc., L., 404 Fourth Ave., New York 16, N. Y.
Sonner Burner Co., 412-420 E. 6th Ave., Winfield, Kans.
Sonoco Products Co., Hartsville, S.C.
South Bend Air Products, Inc., 322 E. Colfax Ave., South Bend 22. Ind.
South Chester Corp., Southco Div., Lester, Pa.
South Chester Tube Co., Front & Thurlow Sts., P. O. Box 60, Chester. Pa.
Souther Iron Co., E. E., 1952 Kienlen Ave., St. Louis 20, Mo.
Southern Plastics Co., 408 Pendleton, Columbia, S. C.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Southwestern Plastic Pipe Co., P. O. Box 117, Mineral Wells, Tex.
Southworth Machine Co., 30 Warren Ave., Portland, Me.
Span Brass Mfg. Co., Wilmot St., Otsego, Mich.
Spang-Chalfant, Div. of The National Supply Co., P. O. Box 416, Pittsburgh 30, Pa.
Sparkler Mfg. Co., Mundelein, Ill.
Sparks-Withington Co., 2301 E. Michigan, Jackson, Mich.
Spartan Convector Co., Inc., 52-55 74th St., Maspeth 78, N. Y.
Spartan Tool Co., 1918 Columbia Ave., Chicago 26, Ill.
Special Chemicals Corp., 100 S. Water St., Ossining, N. Y.
Special Screw Products, Box 391, Bedford, O.
Speco, Inc., 7308 Associate Ave., Cleveland 9, O.
Speedline Stainless Steel Fittings Div., Horace T. Potts Co., Erie Ave. & "D" St., Philadelphia 34, Pa.
Speed Selector Inc., P. O. Box 312, Chagrin Falls, O.
Speedway Mfg. Co., Div. of Thor Power Tool Co., 1834 S. 52nd Ave., Chicago (Cicero), Ill.
Speed-Seam Co., 820 N. Walcott, Chicago 22, Ill.
Spence Engineering Co., Inc., 32 Grant St., Walden, N. Y.
Spencer Heater, Lycoming Div., Avco Mfg. Corp., 652 Oliver St., Williamsport, Pa.
Spencer Thermostat Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
Spencer Turbine Co., 486 New Park Ave., Hartford 6, Conn.
Sperti, Faraday, Inc., 720 Grand St., Hoboken, N. J.
Spi-Rol-Fin Corp., 133 Greenwood Ave., Pequannock, N. J.
Spincraft, Inc., 4132 W. State St., Milwaukee, Wis.
Sponge Products Div., B. F. Goodrich Co., Derby Place, Shelton, Conn.
Sporlan Valve Co., 7525 Sussex Ave., St. Louis 17, Mo.

Sprague Electric Co., Marshall St., North Adams, Mass.
Spray Engineering Co., 114 Central St., Somerville 45, Mass.
Spraying Systems Co., 3219 Randolph St., Bellwood, Ill.
Sprayo-Flake Co., 2715 Irving Park Blvd., Chicago 18, Ill.
Spring Packing Corp., 332 S. Michigan Ave., Chicago, Ill.
Springfield Boiler Co., 1939 E. Capitol Ave., Springfield, Ill.
Springload Mfg. Corp., 3610 - 1st Ave., South, Seattle 4, Wash.
Sprout-Waldron & Co., Muncy, Pa.
Spurgeon Co., 23501 Hoover Rd., Van Dyke, Mich.
Square D Co., 6060 Rivard St., Detroit 11, Mich.
Square D Co., Industrial Controller Div., 4041 N. Richards St., Milwaukee 12, Wis.
Squires Co., C. E., The, 18502 Syracuse Ave., Cleveland 10, O.
Stainless Processing Div., Wall Colmonoy Corp., 19345 John R St., Detroit, Mich.
Stainless Welded Products, Inc., 1 Clifton Blvd., Clifton, N. J.
Stalwart Rubber Co., The, 381 Northfield Rd., Bedford, O.
Stamco Inc., New Bremen, O.
Stanat Mfg. Co., Inc., 47-36 37th St., Long Island City 1, N. Y.
Standard Asbestos Mfg. Co., 860 W. Evergreen Ave., Chicago 22, Ill.
Standard Electric Mfg. Co., West Berlin, N. J.
Standard Engineering Wks., 289 Roosevelt Ave., Pawtucket, R. I.
Standard Fuel Engineering Co., 667 Post Ave., S., Detroit 17, Mich.
Standard Instrument Div., Heat Timer Corp., 657 Broadway, New York 1, N. Y.
Standard Machine & Mfg. Co., 8213-15 Gravois Ave., St. Louis 23, Mo.
Standard Oil Co. of California, 225 Bush St., San Francisco, Calif.
Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill.
Standard Pressed Steel Co., Box 810, Jenkintown, Pa.
Standard Refrigeration Co., 3535 W. Fillmore St., Chicago 24, Ill.
Standard Reseater Co., 423 W. 126th St., New York 27, N. Y.
Standard Stamping & Perforating Co., 3151 W. 49th Pl., Chicago 32.
Standard Transmission Equipment Co., 70 W. Union St., Pasadena 1, Calif.
Standard Tube Co., 24400 Plymouth Rd., Detroit 39, Mich.
Stanley Electric Tools, Div. of The Stanley Works, Myrtle St., New Britain, Conn.
Stanley Works, The, 195 Lake St., New Britain, Conn.
Staples & Pfeiffer, 528 Bryant St., San Francisco 7, Calif.
Sta-Rite Products, Inc., 305 S. 8th St., Delavan, Wis.
Star Expansion N. Y., Inc., 142 Liberty St., New York 6, N. Y.
Star-Kimble Motor Div., Miehle Printing Press & Mfg. Co., 200 Bloomfield Ave., Bloomfield, N. J.
Star Stainless Screw Co., 646 Union Blvd., Paterson 2, N. J.
Star Tubular Products Co., 4747 S. Richmond St., Chicago, Ill.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Stearns Co., N. C., P. O. Box 1234, Shreveport, La.
Stedco Products, 71 Lehigh St., Wilkes-Barre, Pa.
Steel City Electric Co., 1207 Columbus Ave., Pittsburgh, Pa.
Steelcote Mfg. Co., 3418 Gratiot St., St. Louis, Mo.
Steel Improvement & Forge Co., The, 970 E. 64th St., Cleveland 3, O.
Steel Products Engineering Co., The, 1205 W. Columbia St., Springfield, O.
Steinen Mfg. Co., Wm., 43 Bruen St., Newark 5, N. J.
Sterlairco, Inc., 265 N. Elm St., Westfield, Mass.
Sterling, Inc., 3744 N. Holton St., Milwaukee 12, Wis.
Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.
Sterling Engineering & Mfg. Corp., 114 Business St., Hyde Park 36, Mass.
Sterling Radiator Co., Inc., 260 N. Elm St., Westfield, Mass.
Sterns-Flinn Corp., 30 Church St., New York 7, N. Y.
Stevens Mfg. Co., Inc., P. O. Box 1007, Mansfield, O.
Stewart Ice Machine Co., 1282 W. 1st St., Pomona, Calif.
Stewart Industries, Inc., 10 Colfax Ave., Clifton, N. J.
Stewart Mfg. Co., Inc., Grove Ave., Cedar Grove, N. J.
Stewart-Warner Corp., South Wind Div., 1514 Drover St., Indianapolis, Ind.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis 18, Ind.
Stic-Klip Mfg. Co., Inc., 112 Regent St., Cambridge 40, Mass.
Stillwater Clay Products Co., The, 3334 Prospect Ave., Cleveland 15.
Stockham Valves & Fittings, Box 2592, Birmingham 2, Ala.
Stoddard Industries, Inc., 1545 N. Kingsbury, Chicago 22, Ill.
Stokes Molded Products, Div. of Electric Storage Battery Co., Taylor & Webster, Trenton 4, N. J.
Stout & Sons, David, 7016 Manchester Blvd., St. Louis 17, Mo.
Stover Water Softener Co., 10 State Ave., St. Charles, Ill.
Stow Mfg. Co., 445 State St., Binghamton, N. Y.
Strahman Valves, Inc., 16-22 Hudson St., New York 13, N. Y.
Stratford Pipe Scalloper Co., 1105 Ewing Ave., Clearwater, Fla.
Strong, Carlisle & Hammond, 1392 W. Third St., Cleveland 13, O.
Struthers-Dunn, Inc., Lamb's Rd., Pitman, N. J.
Struthers Wells Corp., Titusville, Pa.
Sturtevant Co., P. A., Addison, Ill.
Sub-Zero Freezer Co., Inc., Route 3, P. O. Box 2017, Madison, Wis.
Sudbury Laboratory, South Sudbury, Mass.
Sulflo, Inc., 1143 E. Jersey St., Elizabeth 4, N. J.
Sullivan Valve & Engineering Co., 1400 E. Second St., Butte, Mont.
Summit Products Co., Uniontown, Pa.
Sundstrand Hydraulic Div., 2210 Harrison Ave., Rockford, Ill.
Sun-Fire Stoker Corp., New Albany, Ind.
Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa.
Sun-Ray Burner Mfg. Corp., 139-24 Queens Blvd., Jamaica 35, N. Y.
Sunwarm, Inc., P. O. Box 263, Kingsport, Tenn.
Super Radiator Corp., 6714 Walker St., St. Louis Park, Minneapolis 16, Minn.
Super Steel Products Co., 1244 N. 4th St., Milwaukee, Wis.
Super Tool Co., 21650 Hoover Rd., Detroit 13, Mich.
Superior Clay Corp., The, Uhrichsville, O.
Superior Combustion Industries, Inc., Times Tower, Times Sq., New York 36, N. Y.
Superior Tube Co., Norristown, Pa.
Superior Valve and Fittings Co., 1509 W. Liberty Ave., Pittsburgh 26, Pa.
Supreme Electric Products Corp., 194 Vassar St., Rochester 7, N. Y.
Surface Chemicals, Inc., 1101 Thompson Ave., McKees Rocks, Pa.
Surface Combustion Corp., 2375 Dorr St., Toledo 1, O.
Sutorbilt Corp., 2008 E. Slauson, Los Angeles, Calif.
Sutton Corp., O. A., The, 1812 W. Second St., Wichita 2, Kan.
Swaby Mfg. Co., 3818 W. Armitage Ave., Chicago 47, Ill.
Swaine Mfg. Co., Fred J., 1300 N. Seventh St., St. Louis 6, Mo.
Swartwout Co., The, 18511 Euclid Ave., Cleveland 12, O.
Swift & Co., Adhesive Products Dept., 4115 S. Packers Ave., Chicago 9, Ill.
Swift Lubricator Co., Inc., 19 James Bldg., Elmira, N. Y.
Swift Mfg. Co., Inc., 31241 Stephenson Highway, Royal Oak, Mich.
Synchronous Flame, Inc., Walworth, Wis.
Synchro-Start Products, Inc., 8151 N. Ridgeway Ave., Skokie, Ill.
Syncromatic Corp., Watertown, Wis.
Syntron Co., 161 Lexington Ave., Homer City, Pa.
Syrall Mfg. Co., 511 N. State St., Syracuse 3, N. Y.

T

Taber Pump Co., 272 Elm St., Buffalo 3, N. Y.
Taco Heaters, Inc., 1160 Cranston St., Cranston 9, R. I.
Tal Bending Equipment Co., 417 N. Water St., Milwaukee 2, Wis.
Taller & Cooper, Inc., 75 Front St., Brooklyn 1, N. Y.
Talon Tools, Inc., North Arlington, N. J.
Tamms Industries, Inc., 228 N. LaSalle St., Chicago 1, Ill.
Tapecoat Co., The, 1523 Lyons St., Evanston, Ill.
Taylor Co., Halsey W., 1259 N. Park Ave., Warren, O.
Taylor Engineering Corp., 6500 Epworth Blvd., Detroit 10, Mich.
Taylor Forge & Pipe Wks., P. O. Box 485, Chicago 90, Ill.
Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y.
Taylor Sons Co., The Charles, 710 Burns St., Cincinnati 14, O.
Taylor-Winfield Corp., 1052 Mahoning Ave., N. W., Warren, O.
Technical Filter Co., 2719 S. Poplar Ave., Chicago, Ill.
Technical Ply-Wood Sales, 6756 Crandon Ave., Chicago 49, Ill.
Techniflex Corp., Port Jervis, N. Y.
Tech-Tron Corp., 2205 Haskell Ave., Lawrence, Ks.
Tecumseh Products Co., Tecumseh, Mich.
Tedd Company, The, P. O. Box 1621, Rockford, Ill.
Teleflex Incorporated, P. O. Box 69, North Wales, Pa.
Temco, Inc., 4101 Charlotte, Nashville, Tenn.
Templeton Bros., 177 Reservation Rd., Hyde Park 36, Mass.
Tempo Products Co., 6515 Carnegie Ave., Cleveland 3, O.
Temprite Products Corp., Dept. HPAC, E. Maple Rd., Birmingham, Mich.
Tennessee Coal & Iron Div., United States Steel Corp., P. O. Box 599, Fairfield, Ala.
Tennessee Products and Chemical Corp., First American National Bank Bldg., Nashville, Tenn.
Tenney Engineering, Inc., 1090 Springfield Rd., Union N. J.
Termite Drills, Inc., 90 N. Lotus Ave., Pasadena 8, Calif.
Terre Haute Boiler Works Co., 1140 Crawford, Terre Haute, Ind.
Terry Steam Turbine Co., The, P. O. Box 1200, Hartford 1, Conn.
Texas Co., The, 135 E. 42nd St., New York 17, N. Y.
Texas Vitrified Pipe Co., Mineral Wells, Tex.
Texsteam Corp., P. O. Drawer 9127, Houston 11, Tex.
Thermac Co., 800 E. 108th St., Los Angeles, Calif.
Thermador Electrical Mfg., 5119 S. District Blvd., Los Angeles 22, Calif.
Thermal Agency, 11 N. Jackson, Houston, Tex.
Thermal Engineering Corp., 2605 W. Dallas, Houston 19, Tex.
Thermo-Base Div., Gerwin Industries, 214 Spring St., Michigan City, Ind.
Thermo Electric Co., Inc., Saddle Brook, N. J.
Thermoid Co., 200 Whitehead Road, Trenton, N. J.
Thermo King Corp., 44 S. 12th St., Minneapolis, Minn.
Thermo-Mat Co., 814 S. Robertson Blvd., Los Angeles 35, Calif.
Thermo-Products, Inc., North Judson, Ind.
ThermoRay Corp., 26 Ave. B, Newark, N. J.
Thermo-Sound Products, Div. of Kittell-Lacy, Inc., 10816 E. Fawcett Ave., El Monte, Calif.
Thermotank, Inc., Products Div., 11191 Lappin Ave., Detroit 34, Mich.
Therm-O-Wheel, Inc., 1040 B-22 St., Far Rockaway 91, N. Y.
Thomas Co., Arthur H., W. Washington Square, Philadelphia, Pa.
Thomas Flexible Coupling, Main Ave. & Biddle St., Warren, Pa.
Thomas Industries, Inc., Electric Sprayit Div., 1415-25 Illinois Ave., Sheboygan, Wis.
Thompson and Co., 1085 Allegheny Ave., Oakmont, Pa.
Thompson & Son Co., The Henry G., 277 Chapel St., New Haven, Conn.
Thompson Research & Mfg. Co., Davenport, Fla.
Thomson Electric Welder Co., 161 Pleasant St., Lynn, Mass.
Thor Power Tool Co., 175 N. State St., Aurora, Ill.
Thor Tool & Die Co., 865 Estabrook, San Leandro, Calif.
Thread-Ezy Mfg. Co., Corunna, Mich.
Threadwell Tap & Die Co., Greenfield, Mass.
Three Point Industries, 1821 Howard St., Evanston, Ill.
Thrush & Co., H. A., Peru, Ind.
Thwing-Albert Instrument Co., Penn and Pulaski Ave., Philadelphia 44, Pa.
Tierney Rotor Ventilator Co., 239 Fourth Ave., S., Minneapolis, Minn.

Timken Roller Bearing Co., 1835 Dueber Ave., S. W., Canton 6, O.
Timken Silent Automatic Div., Rockwell Spring & Axle Co., Jackson, Mich.
Tinnerman Products, Inc., Dept. No. 16, P. O. Box 6688, Cleveland 1, O.
Tipp Manufacturing Co., Tipp City, O.
Tippett & Wood, Morris and Warren Sts., Phillipsburg, N. J.
Titeflex, Inc., Hendee St. off Page Blvd., East Springfield, Mass.
Titus Mfg. Corp., Box 810, Hiway 20 West, Waterloo, Iowa
Titusville Iron Wks. Co., The, Titusville, Pa.
Tjernlund Mfg. Co., 2140 Kasota Ave., St. Paul 14, Minn.
Todd Shipyards Corp., Products Div., Columbia & Halleck Sts., Brooklyn, N. Y.
Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo 4, O.
Torit Mfg. Co., 292 Walnut St., St. Paul 2, Minn.
Tork Time Controls, Inc., 1 Grove St., Mt. Vernon, N. Y.
Torrington Co., The, Bantam Bearings Div., South Bend 21, Ind.
Torrington Mfg. Co., The, Torrington, Conn.
Torrington Mfg. Co., The, Western Div., 15001 Oxnard St., Van Nuys, Calif.
TOT Towers, Inc., P.O. Box 2564, 5220 Lawndale, Houston 1, Texas
Toungate & Coats, P. O. Box 9156, Allandale Station, Austin 17, Tex.
Tracerlab, Inc., 130 High St., Boston, Mass.
Trade-Wind Motorfans, Inc., 7755 Paramount Bldg., Rivera, Calif.
Trane Co., The, La Crosse, Wis.
Tranter Mfg. Inc., Lansing 4, Mich.
Trent, Inc., Leverington Ave. and Wilde St., Philadelphia 27, Pa.
Trent Tube Co., 430 Church St., East Troy, Wis.
Trerice Co., H. O., 1420 W. Lafayette Blvd., Detroit 16, Mich.
Triangle Conduit & Cable Co., Inc., Triangle & Jersey Aves., New Brunswick, N. J.
Triangle Mfg. Co., 396 Division St., Oshkosh, Wis.
Trico Fuse Mfg. Co., 2948 N. 5th St., Milwaukee 12, Wis.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., 50 Frank St., Worcester, Mass.
Trimount Instrument Co., 3119 W. Lake St., Chicago 12, Ill.
Trindl Products, Ltd., 1807-11 S. Clark St., Chicago 16, Ill.
Trion, Inc., 1000 Island Ave., McKees Rocks, Pa.
Tripar Products, Inc., 14641 West Eleven Mile Rd., Royal Oak, Mich.
Triplex Heating Specialty Co., Inc., 252 N. Grant, Peru, Ind.
Trombetta Solenoid Corp., 329 N. Milwaukee St., Milwaukee 2, Wis.
Tropical Paint Co., 1244-82 W. 70th St., Cleveland 2, O.
Troy Engine & Machine Co., 20 Railroad Ave., Troy, Pa.
Truflo Fan Co., 523 Main St., Harmony, Pa.
Truscon Laboratories Div., Devoe & Raynolds Co., Inc., Caniff and Trunk R. R., Detroit 11, Mich.
Truscon Steel Div., Republic Steel Corp., 1315 Albert St., Youngstown 1, O.
Tryco Products, Inc., Railroad Sq., Westfield, Mass.
Tube Turns, A Div. of National Cylinder Gas Co., 224 E. Broadway, Louisville 1, Ky.
Tube Turns Plastics, Inc., 2929 Magazine St., Louisville 1, Ky.
Tubenfin Coil Co., 8035 Hartford, Houston, Tex.
Tubing Seal-Cap, Inc., 808 W. Santa Anita, San Gabriel, Cailf.
Tuck-Aire Furnace Co., 2045 Evans Ave., San Francisco 24, Calif.
Tulsa Canvas Products Co., Inc., P. O. Box 2072, Tulsa, Okla.
Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.
Turner Brass Wks., The, 821-47 Park Ave., Sycamore, Ill.
Tuthill Pump Co., 939 E. 95th St., Chicago 19, Ill.
Tuttle & Bailey, Div. of Allied Thermal Corp., Corbin Ave., New Britain, Conn.
Tweco Products Inc., P. O. Box 666, Wichita 1, Kan.
Twin Disc Clutch Co., 1310 Preston, Rockford, Ill.
Typhoon Air Conditioning Co., Div. of Hupp Corp., 505 Carroll St., Brooklyn 15, N. Y.
Typhoon Heat Pump Co., Div. of Hupp Corp., 2001 Garcia Ave., P. O. Box 1123, Tampa, Fla.

U

[Also see "United States"]
U. S. Electrical Motors Inc., 200 E. Slauson Ave., Los Angeles 54.
U. S. Expansion Bolt Co., P. O. Box 827, State St. & P.R.R., York, Pa.
U. S. Pipe & Mfg. Co., East Grand Ave., S. San Francisco, Calif.
U. S. Plug & Fitting Co., Wellington, O.
Uehling Instrument Co., 473 Getty Ave., Paterson 3, N. J.
Ulrich Mfg. Co., Bump Pump Div., Roanoke, Ill.
Ultrasonic Corp., 640 Memorial Dr., Cambridge 39, Mass.
Ultra-Viscoson Corp., The, 1240 Main St., Hartford 3, Conn.
Unarco Air Conditioning Products, Heating & Air Conditioning Div., National-U.S. Radiator Corp., Johnstown, Pa.
Unexcelled Chemical Corp., Empire State Bldg., New York, N. Y.
Unifilter Co., 29845 W. 13 Mile Rd., Farmington, Mich.
Uniflow Mfg. Co., E. Lake Rd., Erie, Pa.
Uniflow Valve Corp., 19 Quine St., Cranford, N. J.
Unimax Switch Div., W. L. Maxson Corp., 460 W. 34th St., Ives Rd., Wallingford, Conn.
Union Chill Mat Co., Grant Bldg., Pittsburgh, Pa.
Union Electric & Mfg. Co., 1057 Summit Ave., Jersey City, N. J.
Union Iron Wks., 1500 Cascade St., Erie, Pa.
Union Malleable Mfg. Co., Clark St., Ashland, O.
Union Metal Wks. Co., Inc., 128 Carter St., Chelsea 50, Mass.
Union Pipe Fitting Co., Fort Atkinson, Wis.
Union Steam Pump Co., Capitol Ave., S. W., Battle Creek, Mich.
Unistrut Products Co., 933 W. Washington Blvd., Chicago 7, Ill.
United Carr Fastener Corp., 31 Ames St., Cambridge, Mass.
United Centrifugal Pumps, 580 Second St., Oakland, Calif.
United Cooling Tower Co., P. O. Box 5959, 4022 Broadway, Kansas City 11, Mo.
United Cork Companies, 1 Central Ave., Kearny, N. J.
United Electric Co., P. O. Box 119, Wichita Falls, Tex.
United Electric Controls Co., 85 School St., Watertown, Mass.
United Machinery Sales Co., 7709 S. Ashland Ave., Chicago 20, Ill
United Metal Hose Co., Inc., 36-01 43rd Ave., Long Island City 1, N. Y.
United Mineral & Chemical Corp., 16 Hudson St., New York 13, N. Y.
United Sheet Metal Co., Inc., 540 S. Drexel Ave., Columbus 9, O.
United Specialties, Inc., P.O. Box 698, El Dorado, Ark.
[Also see "U. S."] -
United States Air Conditioning Corp., 7900 Tabor Road, Philadelphia 11, Pa.
United States Cooling Tower Co., Div. of Heatcraft Co., 414 W. Main St., Louisville, Ky.
United States Electrical Tool Co., 3640 Llewellyn St., Cincinnati 23, O.
United States Gasket Co., 602 N. 10th St., Camden, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
United States Gypsum Co., 300 W. Adams St., Chicago 6, Ill.
United States Mineral Wool Co., Stanhope, N. J.
United States Pipe & Foundry Co., Birmingham, Ala.
United States Register Co., Burnham St., Battle Creek, Mich.
United States Rubber Co., 1230 Ave. of the Americas, New York 20.
United States Steel Corp., 525 Wm. Penn Place Bldg., Pittsburgh 30.
United States Steel Supply Div., United States Steel Corp., 208 S. La Salle St., Chicago 4, Ill.
United States Stoneware Co., 60 E. 42nd St., New York 17, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron 9, O
United Wire & Supply Corp., 1497 Elmwood Ave., Cranston, R. I.
Universal Controls Corp., P. O. Box 13122, Dallas 20, Tex.
Universal Diffuser Corp., 38 Marbledale Rd., Tuckahoe, N. Y.
Universal Electric Co., Owosso, Mich.
Universal Gear Works, Inc., 1301 E. McNichols Rd., Detroit 3, Mich.
Universal Major Electric Appliances, Inc., P. O. Box 928, Baltimore Md.
Universal Metal Hose Co., 2133 S. Kedzie Ave., Chicago, Ill.
Universal Welder Corp., 2557 E. 79th St., Cleveland, O.
University Fan & Blower Co., 733 University Ave., Berkeley 10, Calif
Uno Ventilator Co., 1236 Eastern Ave., Malden 48, Mass.
Utah Hydro Corp., Ness Bldg., Salt Lake City, Utah
Utica Products, Inc., Utica 4, N. Y.
Utica Radiator Corp., 2201 Dwyer Ave., Utica 2, N. Y.
Utility Appliance Corp., 4851 S. Alameda St., Los Angeles 58, Calif.
Utility Fan Corp., Div. of Utility Appliance Corp., 911 E. 59th St. Los Angeles 1, Calif.

V

V. & E. Products, Inc., Schuylkill Haven, Pa.
V-Belt Clutch Co., 418 N. Western Ave., Los Angeles 4, Calif.
Vacu-Blast Co., Inc., P. O. Box 885, Belmont, Calif.
Vacuum-Electronic Engineering Co., 86 Denton Ave., New Hyde Park, L. I., N. Y.
Vacuum Gas Burner, Olean, N. Y.
Valco, Inc., 1410 West St., Cincinnati 15, O.
Valdura Div., American-Marietta Co., 101 E. Ontario St., Chicago 11, Ill.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Valve Div. of ACF Industries, 1501 E. Ferry, Detroit, Mich.
Valves, Inc., F. G., 6450 W. River Parkway, Milwaukee, Wis.
Vanderman Mfg. Co., Mansfield Ave., Willimantic, Conn.
Van Noorden Co., E., 100 Magazine St., Boston 19, Mass.
Van-Packer Corp., Bettendorf, Ia.
Vanton Pump & Equipment Corp., 201 Sweetland Ave., Hillside, N. J.
Vapor Heating Corp., 80 E. Jackson Blvd., Chicago 4, Ill.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., 201 N Braddock Ave., Pittsburgh 8, Pa.
Ventfabrics, Inc., 640 N. Kedzie Ave., Chicago 12, Ill.
Vernon Tool Co., Ltd., 1109 Meridian Ave., Alhambra, Calif.
Verson Allsteel Press Co., 93rd & Kenwood Ave., Chicago 19, Ill.
Verson Mfg. Co., S. Lamar St. & Ledbetter Dr., Dallas, Tex.
Vibration Eliminator Co., 10-28 47th Ave., Long Island City 1, N. Y
Vibration Mountings Inc., 98-25 50th Ave., Corona 68, N. Y.
Vic Mfg. Co., 1313 Hawthorne Ave., Minneapolis, Minn.
Victaulic Co. of America, P. O. Box 509, Elizabeth, N. J.
Victor Equipment Co., Welding Equipment Div., 844 Folsom St., San Francisco 7, Calif.
Victor Products Corp., 2633 Belmont Ave., Chicago 18, Ill.
Victory Engineering Corp., 118 Springfield Rd., Union, N. J.
Viking Air Products Div., National-U.S. Radiator Corp., 5601 Walworth Ave., Cleveland, O.
Viking Copper Tube Co., 16700 St. Clair, Cleveland, O.
Viking Mfg. Corp., 1747 Chester Ave., Cleveland 14, O.
Viking Pump Co., Fourth and Rouse Sts., Cedar Falls 1, Ia.
Viking Shear Co., 1063 W. 19th St., Erie, Pa.
Vilter Mfg. Co., The, 2148 S. First St., Milwaukee 7, Wis.
Vimasco Corp., P. O. Box 465, Nitro, W. Va.
Virginia Smelting Co., West Norfolk, Va.
Vis-A-Plug, Inc., P. O. Box 100, King of Prussia, Pa.
Vogt Machine Co., Henry, 1000 W. Ormsby St., Louisville 10, Ky.
Vortox Company, Claremont, Calif.
Voss Co., Inc., J. H. H., 785 E. 144th St., Corner of Wales Ave. New York 54, N. Y.
Vulcan Electric Co., 88-90 Holten St., Danvers, Mass.
Vulcan Radiator Co., 775 Capitol Ave., Hartford 6, Conn.

W

W. G. B. Oil Clarifier, Inc., Kingston, N. Y.
W-K-M Mfg. Co., Div. of ACF Industries, Inc., Box 2117, Houston, Tex.
W-S Fittings Div., H. K. Porter Co., Inc., P.O. Box 95, Roselle, N. J.
Wabash Corp., 2318 S. Western Ave., Chicago 8, Ill.
Wachs Co., E. H., The, 1525 N. Dayton St., Chicago 22, Ill.
Waco Steel Scaffolding, Inc., 630 N. Valley Mills Dr., Waco, Tex.
Wade Mfg. Co., Elgin, Ill.
Wagner Awning & Mfg. Co., 2658 Scranton Rd., Cleveland, O.
Wagner Electric Corp., 6370 Plymouth Ave., St. Louis 14, Mo.
Wakefield Co., The, Vermilion, O.
Waldron Corp., John, New Brunswick, N. J.
Walker Jamar Co., 365 S. First Ave., E., Duluth, Minn.
Walker Mfg. & Sales Co., 1720 Penn St., St. Joseph, Mo.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Wallace Products Co., B. E., Exton 20, Pa.
Wallace Supplies Mfg. Co., 1304-12 Diversey Pkwy., Chicago 14, Ill.
Wallace & Tiernan Incorporated, 25 Main St., Belleville 9, N. J.
Walsh Co., The L. M., 755 Boylston St., Boston 16, Mass.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., 110 Appleton St., Holyoke, Mass.
Walton Co., Box 5, Elmwood Branch, Hartford 10, Conn.
Walton Laboratories, Inc., 1186 Grove St., Irvington 11, N. J.
Walworth Co., 60 E. 42nd St., New York 17, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Ward Leonard Electric Co., 24 South St., Mt. Vernon, N. Y.
Ware Coupling & Nipple Co., Ware, Mass.
Warner Electric Brake & Clutch Co., Beloit, Wis.
Warner Lewis Co., Div. of Fram Corp., 817 N. Lewis Pl., Tulsa, Okla.
Warner Ventilator Co., 225 Spring St., La Grange, Ind.
Warren Engineering Co., Broadway, N. J.
Warren Foundry & Pipe Corp., 55 Liberty St., New York 5, N. Y.
Warren Refining & Chemical Co., The, 5151 Denison Ave., Cleveland 2, O.
Warren Steam Pump Co., Inc., 300 Bridges Ave., Warren, Mass.
Washington Steel Corp., Griffith Ave., Washington, Pa.
Wassco Electric Products Corp., 126 W. Cass St., Joliet, Ill.
Water Cooling Corp., 71 Nassau St., New York 38, N. Y.
Water Cooling Equipment Co., 8601 New Hampshire, St. Louis 23, Mo.
Water Service Laboratories, Inc., 423 W. 126th St., New York 27.
Water Tight Underground Conduit, P. O. Box 12211, Houston 17, Tex.
Water Treatment Company of America, 1159 Hodgkiss St., Pittsburgh 12, Pa.
Waterloo Register Co., Inc., P. O. Box 72, Waterloo, Ia.
Waterman-Waterbury Co., The, 1121 Jackson St., N. E., Minneapolis 13, Minn.
Watkins Co., J. E., 307 Lake Street, Maywood, Ill.
Wa-Trol, 3232 Louisiana St., P. O. Box 6366, Houston, Tex.
Watson & McDaniel Co., 440 N. Marshall, Philadelphia 23, Pa.
Watson-Standard Co., 225 Galveston Ave., Pittsburgh 30, Pa.
Watts Regulator Co., 10 Embankment St., Lawrence, Mass.
Waukesha Foundry Co., Waukesha, Wis.
Waukesha Motor Co., Waukesha, Wis.
Waverly Heating Supply Co., 31 Union St., Boston 8, Mass.
Way-Wolff Associates, 33 Fulton St., New York 38, N. Y.
Wayne Pump Co., Salisbury, Md.
Weatherall Engineers, Inc., 478 Smithfield Ave., Providence, R. I.
Weatherhead Co., The, Ft. Wayne Div., 128 W. Washington Blvd., Ft. Wayne, Ind.
Weather King of Florida, Inc., 2310 Coolidge Ave., Orlando, Florida
Webb Corp., The, Webb City, Mo.
Webster & Co., Warren, 1664 Federal St., Camden 5, N. J.
Webster Electric Co., Clark & DeKoven Aves., Racine, Wis.
Webster Engineering Co., P. O. Box 2168, Tulsa 1, Okla.
Wedgeplug Valve Co., Inc., Box 2592, Birmingham 2, Ala.
Wedge Protectors, Inc., 3985 Jennings Rd., Cleveland 9, O.
Weighing & Control Components, Inc., Box 245, 206 Lincoln Ave., Hatboro, Pa.
Weil-McLain Co., Michigan City, Ind.
Weil Pump Co., 1523 N. Fremont St., Chicago 22, Ill.
Weinman Pump Mfg. Co., The, 290 W. Spruce St., Columbus 8, O.
Weirton Steel Co., Weirton, W. Va.
Weksler Thermometer Corp., East Merrick Rd., Freeport, N. Y.
Weldex, Inc., 18425 Weaver, Detroit, Mich.
Welding Apparatus Co., 2750 W. Van Buren St., Chicago, Ill.
Welding Fittings Corp., New Castle, Pa.
Weldit, Inc., 990 Oakman Blvd., Detroit 38, Mich.
Welsbach Corp., The, Kitson Valve Div., 1500 Walnut St., Philadelphia 2, Pa.
Wendt Co., O. A., 1655 W. Fullerton Ave., Chicago 14, Ill.
Wesix Electric Heater Co., 390-1st St., San Francisco 5, Calif.
West Instrument Corp., 4363 W. Montrose Ave., Chicago 41, Ill.
Western Blower Co., 1800 Airport Way, Seattle 4, Wash.
Western Engineering & Mfg. Co., 4114 Ocean Park Ave., Venice, Calif.
Western Felt Works, 4029-4117 Ogden Ave., Chicago 23, Ill.
Western Plastics Corp., 3110 Ruston Way, Tacoma, Wash.
Western Piping & Engineering Co., 123 Kansas St., San Francisco 3.
Western Precipitation Corp., 1016 W. 9th St., Los Angeles, Calif.
Western Wire & Iron Works, Inc., 957 W. 18th Pl., Chicago 8, Ill.
Western Wire Products Co., 1415-35 S. 18th St., St. Louis 4, Mo.
Westinghouse Air Brake Div., Three Gateway Center, Pittsburgh, Pa.
Westinghouse Electric Corp., P. O. Box 868, Pittsburgh 30, Pa.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass.
Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.
Westinghouse Electric Corp., Sturtevant Div., 136 Readville St., Hyde Park, Boston 36, Mass.
Westline Products Div., Western Lithograph Co., 600 E. 2nd St., Los Angeles 54, Calif.
Weston Electrical Instrument Corp., A Subsidiary of Daystrom, Inc., 614 Frelinghuysen Ave., Newark, N. J.
Wheatland Tube Co., Bankers Securities Bldg., Juniper & Walnut Sts., Philadelphia 7, Pa.
Wheelabrator Corp., 904 S. Byrkit St., Mishawaka, Ind.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Wheeler Mfg. Co., C. H., 19th & Lehigh, Philadelphia 32, Pa.
Wheeler Mfg. Co., C. H., Economy Pump Div., 19th & Lehigh, Philadelphia 32, Pa.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Machine Products Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling Steel Corp. Bldg., Wheeling, W. Va.
Whiddett Co., John C., 3850 Garrett Rd., Drexel Hill, Pa.
Whirlpool-Seeger Corp., Evansville, Ind.
White Flomatic Corp., P. O. Box 267, Hoosick Falls, N. Y.
White-Rodgers Co., 1209 Cass Ave., St. Louis 6, Mo.
Whitehall Engineering Co., Inc., 1630 S. Michigan, Chicago, Ill.
Whiteley Bearing Corp., 1238 S. Ashland Ave., Chicago 8, Ill.
Whitewater Pump Co., Inc., Whitewater, Wis.
Whiting Corp., Harvey, Ill.
Whiting Fire Power Products Corp., 1101 John Ave., Superior, Wis.
Whitlock Mfg. Co., 44 South St., West Hartford 10, Conn.
Whitney Chain Co., 237 Hamilton St., Hartford 2, Conn.
Whitney Mfg. Co., W. A., 636 Race St., Rockford, Ill.
Whitney Metal-Tool Co., 110 Forbes St., Rockford, Ill.
Whiton Machine Co., 190 Howard, New London, Conn.
Whittaker Co., Ltd., Wm. R., 915 N. Citrus Ave., Los Angeles, Calif.
Whittington Pump & Engineering Corp., 1126 Prospect, Indianapolis 3 Ind.
Whitty Co., Inc., 86 Western Ave., Boston 34, Mass.
Wickes Boiler Co., The, 515 N. Washington, Saginaw, Mich.
Wickwire Spencer Steel Div., The Colorado Fuel & Iron Corp., 575 Madison Ave., New York 22, N. Y.
Wiedemann Machine Co., 4272 Wissahickon Ave., Philadelphia 32, Pa.
Wiegand Co., Edwin L., 7610 Thomas Blvd., Pittsburgh 8, Pa.
Wiggins Oil Tool Co., Inc., E. B., 3424 E. Olympic Blvd., Los Angeles 23, Calif.
Wilbur & Williams Co., 130 Lincoln St., Brighton 35, Mass.
Wilcolator Co., 1001 Newark Ave., Elizabeth B, N. J.
Wilhelm Co., A., 3rd and Bern Sts., Reading, Pa.
Wilkinson Products Co., 3987 Chevy Chase Drive, Pasadena 3, Calif
Will-Burt Co., The, Orrville, O.
Will Corp., 35 Russell St., Rochester 3, N. Y.
Williams & Co., J. H., Buffalo 7, N. Y.
Williams Chemical Co., 487 Broadway, New York 13, N. Y.
Williams Div., Eureka Williams Corp., 1201 East Bell, Bloomington, Ill.
Williams Gauge Co., Inc., The, 2 Gateway Center, Pittsburgh 22, Pa.
Williams & Son, I. B., Dover, N. H.
Williams Valve Co., D. T., Div. of The Schaible Co., 1086 Summe St., Cincinnati 4, O.
Williamson Co., 3500 Madison Rd., Cincinnati 9, O.
Willis Steel Corp., 156 N. Academy St., Galesburg, Ill.
Will-O-Hill Industries, Inc., 37611 Euclid Ave., Willoughby, O.
Willson Products, Inc., 348 Thorn St., Reading, Pa.
Will-Weld Mfg. Co., Inc., 1806 N. 20th St., Omaha 2, Nebr.
Wilmington Plastics Co., 810 S. Heald St., Wilmington, Del.
Wilson & Co., Inc., 4100 S. Ashland Ave., Chicago 9, Ill.
Wilson Co., H. A., The, U. S. Route 22, Union, N. J.
Wilson Co., K. R., General Offices & Factories, Arcade, N. Y.
Wilson Engineering Corp., 6 N. Michigan Ave., Chicago 2, Ill.
Wilson, Inc., Thomas C., 21-11 44th Ave., Long Island City, N. Y.
Wilson Manufacturing Co., 787 S. Barksdale St., Memphis 4, Tenn.
Windmaster Corp., 43 Vine St., Columbus 15, O.
Wind-Way Fan & Ventilator Co., 527 St. Joseph St., New Orleans 1
Wing Mfg. Co., L. J., 140 Vreeland Mills Rd., Linden, N. J.
Winkler & Sons, Inc., A. E., 2337 N. 31st St., Milwaukee 10, Wis.
Winslow Engineering & Mfg. Co. 4069 Hollis, Oakland 8, Calif.
Wintroath Pumps, Div. of Worthington Corp., 1100 S. Meridian Ave., Alhambra, Calif.
Wisconsin Burners Inc., 2720 Emil, Madison, Wis.
Wiss & Sons Co., J., 33 Littleton Ave., Newark 7, N. J.
Wiremold Co., Railroad & Elmwood, Hartford 10, Conn.
Witt Co., A. H., 940 N. Sycamore, Los Angeles, Calif.
Wittek Manufacturing Co., 4305 W. 24th Place, Chicago 23, Ill.
Wittenmeier Machinery Co., 850-860 N. Spaulding Ave., Chicago 51
Wodack Electric Tool Corp., 4627 W. Huron St., Chicago 44, Ill.
Wolfe Co., Inc., The Franklin C., 10567 Jefferson Blvd., Culver City, Calif.
Wolfe-Kote Co., Inc., 1225 North 8th St., Sheboygan, Wis.
Wolverine Tube, Div. of Calumet and Hecla, Inc., 1461 Central Ave. Detroit 9, Mich.
Wood Co., John, Conshohocken, Pa.
Wood Conversion Co., 1881 First National Bank Bldg., St., Paul 1 Minn.
Wood Mfg. Co., A. R., Luverne, Minn.
Wood's Sons Co., T. B., 1275 Fifth Ave., Chambersburg, Pa.
Worcester Valve Co., Inc., 16 Parker, Worcester, Mass.
Worner Electronic Devices, Rankin, Ill.
Worthington Corp., Harrison & Worthington Sts., Harrison, N. J.
Worthington-Gamon Meter Div., Worthington Corp., 296 South St. Newark, N. J.
Wrap-On Co., 341 W. Superior St., Chicago 10, Ill.
Wright-Austin Co., 3245 Wright St., Detroit 7, Mich.
Wright Mfg. Co., 2902 W. Thomas Rd., Phoenix, Ariz.
Wysong & Miles Co., 625 Fulton St., Greensboro, N. C.

X-Y-Z

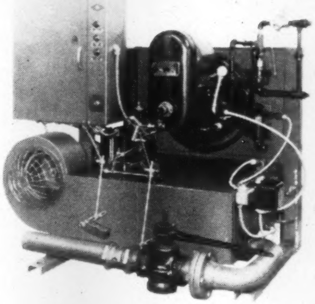
X-4 Corp., West Concord, Mass.
X L Refrigerating Co., 1834 W. 59th St., Chicago 36, Ill.
X Laboratories, Inc., 25 W. 45th St., New York 36, N. Y.
X-Pando Corp., 43-15 36th St., Long Island City 1, N. Y.
Xylos Rubber Co., 1200 Firestone Pkway, Akron 17, O.
Yale & Towne Mfg. Co., Stamford, Conn.
Yardley Plastic Co., 138 Parsons Ave., Columbus 15, O.
Yarnall-Waring Co., 107 Mermaid Ave., Philadelphia 18, Pa.
Yeats Appliance Dolly Sales Co., 2124 N. 12th St., Milwaukee 5, Wis.
Yeomans Bros. Co., 2000-5 N. Ruby St., Melrose Park, Ill.
Yerzley & Co., F., 744 Broad St., Newark, N. J.
York Corp., Commercial Div., Subsidiary of Borg-Warner Corp., Roosevelt Ave., York, Pa.
York-Shipley, Inc., 500 Jessop Place, York, Pa.
Yorktowne Machine Co., 538 S. Queen St., York, Pa.
Yost Mfg. Co., Cambridge Springs, Pa.
Young & Bertke Co., 1004-1014 Hulbert Ave., Cincinnati 14, O.
Young Radiator Co., 709 S. Marquette St., Racine, Wis.
Young Regulator Co., 5209 Euclid Ave., Cleveland 3, O.
Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown 1, O.
Youngstown Welding & Engrg. Co., The, 3714 Oakwood, Youngstown 9, O.
Yula Water Heaters, Inc., 330 Bryant Ave., Bronx, N. Y.
Zack Co., The, 4600 West 12th Place, Chicago 50, Ill.
Zaco Labs., Div. of Zip Abrasive Co., 1360 W. 9th St., Cleveland 13, O.
Zallea Brothers, Taylor and Locust St., Wilmington 99, Del.
Zatko Metal Products Co., 20850 St. Clair Ave., Euclid 17, O.
Zeh & Hahnemann Co., 182-200 Vanderpool St., Newark 5, N. J.
Zenith Electric Co., 152 W. Walton St., Chicago 10, Ill.
Ziegler & Co., G. S., Great Neck, N. Y.
Zimmerman Packing Co., 2768 Highland Ave., Cincinnati 12, O.
Zingheim Co., William C., 5050 Lake St., Chicago 44, Ill.
Zink Co., John, 4401 S. Peoria, Tulsa 5, Okla.
Zone-Heat Regulator Co., Box 188, Garrettsville, O.
Zonolite Co., 135 S. LaSalle St., Chicago 3, Ill.
Zurn Mfg. Div., J. A., Zurn Industries, Inc., 1810 Pittsburgh Ave., Erie, Pa.

Index to Advertisers in this issue appears on page 2d of this yellow Directory Section

Webster DUAL FUEL FIRING BURNERS

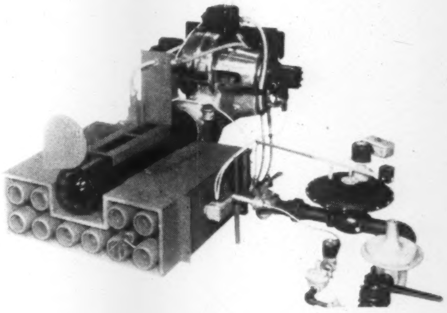
The ROTONETIC*

Dual Fuel Burner utilizing low pressure gas and any grade of commercial fuel oil under forced draft. Completely assembled, wired and tested at the factory; the units are available to 400 horsepower.



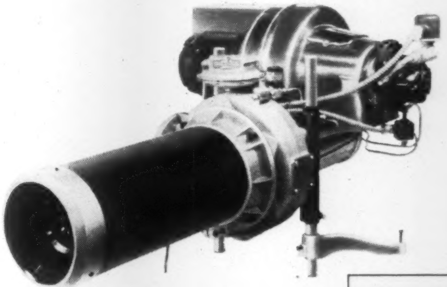
The DUONETIC*

Dual Fuel Burner combining the economy, efficiency and trouble-free operation of the WEBSTER KINETIC Gas Burner with a light oil burner with unique provisions to prevent coking of the oil nozzles. Capacities to 2.5 million Btu/hr.



The CYCLONETIC*

The Webster Cyclonetic* Dual Fuel Burner is designed to operate on either gas or light oil with only the flick of a switch necessary to change from one fuel to another.. Employing 100% forced draft, the Cyclonetic* provides fully automatic operation on both fuels, with complete programming and safety built in. Capacities from 675,000 to 6,900,000 Btu/hr.



*TRADE MARK

WRITE for LITERATURE

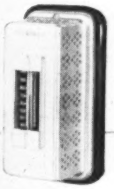
COMBUSTION EQUIPMENT
ENGINEERED By.....THE WEBSTER ENGINEERING COMPANY

The WEBSTER ENGINEERING COMPANY
TULSA, OKLAHOMA
Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio

for the new STATLER HILTON...

"TEXAS-SIZE" COMFORT

with JOHNSON Air Conditioning CONTROL



Statler Hilton Hotel, Dallas, Texas. Wm. Tabler, architect, New York; Jaros, Baum & Bolles, mechanical engineers, New York; J. S. Brown & E. F. Olds Plumbing & Heating Corp., mechanical contractors, Dallas.

Proper zoning, with accurate compensation for the combined effects of sun, outdoor temperature changes, and other factors, insures perfectly conditioned primary air for 1,001 guest rooms, each of which has outside exposure.

Sensitive Johnson Room Thermostats compensate easily for shifting occupancy levels. Whether it's the 2,200-capacity grand ballroom, a busy restaurant, the spacious lobby or a small private dining room, occupants enjoy continuously ideal temperatures.

It takes a lot of comfort—6 million cubic feet of it—to satisfy the needs of the luxurious new Statler Hilton!

Comfort control problems in the 20-floor Dallas showplace include the operation of a 1,400-ton refrigeration system, regulation of a high pressure conduit system for guest room air conditioning and precision control of 20 central fan systems supplying 500,000 cfm of conditioned air to the public areas.

The enjoyment of year 'round ideal temperatures, plus the economies of virtually waste-free air conditioning performance, are made possible by a modern system of Johnson Pneumatic Control. Its up-to-the-minute features include:

- Solar compensation—for maximum guest room comfort regardless of sun, wind, outdoor temperature.
- Central control—for ease in adjusting zone water temperatures from a single location.
- Accurate indoor compensation—for handling varying occupancy levels in public spaces.
- Johnson "economizer" sequencing—for low cost cooling with outdoor air. Up to 100 per cent outdoor air may be used by some of the central fan units to minimize the cooling load.

Today's simplified, improved Johnson Control makes it easy and practical for any building to take advantage of these and other equally advanced control features. Only pneumatic control offers the flexibility to satisfy such control requirements so completely and efficiently, yet so simply and economically. Regardless of your needs, Johnson Pneumatic Control is certain to offer you important advantages in terms of both comfort and economy. Johnson Service Company, Milwaukee 1, Wisconsin. Direct Branch Offices in Principal Cities.

JOHNSON CONTROL

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PLANNING • MANUFACTURING • INSTALLING